C-17 WEAPONS INSTRUCTOR COURSE: UNIT BASING TO OPTIMIZE OPERATIONAL EFFICIENCY AND MISSION EFFECTIVENESS

GRADUATE RESEARCH PAPER

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Abstract

The Department of Defense faces budget cuts approaching one trillion dollars in the next year. At the same time, it retains the responsibility to maintain war fighting capability on a tumultuous international stage. Within this environment, the United States Air Force must seize opportunities to find efficiencies without decreasing mission effectiveness. This research identifies efficiencies for 57th Weapons Squadron flying operations, a small unit located at Joint Base McGuire-Dix-Lakehurst, New Jersey. It uses a cost minimization methodology to systematically identify an alternate basing location for the 57th Weapons Squadron and then compare it to the current location in New Jersey. This study seeks to limit en-route flight time not contributing to the production of C-17 weapons officers. While decreasing en-route flight time, this study also limits the cost associated with deployment to temporary duty locations and Air Mobility Command requirements to support 57th Weapons Squadron operations. This paper proposes that by identifying and quantifying the costs associated with cadre and student syllabus training it will find significant savings and maintain or increase 57th Weapons Squadron effectiveness.

To my Wife, Daughter, and Son

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Brian J. Smith

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C-17 WEAPONS INSTRUCTOR COURSE: UNIT BASING TO OPTIMIZE OPERATIONAL EFFICIENCY AND MISSION EFFECTIVENESS

I. Introduction

Background, Motivation, and Problem Statement

The United States Air Force Weapons School (USAFWS) is located at Nellis Air Force Base (AFB), Nevada. It is the parent unit for 18 squadrons, eleven of which are physically located at Nellis AFB, NV (Factsheets, 2011). The remaining seven squadrons are geographically separated. One geographically separated squadron is the 57th Weapons Squadron (57 WPS). The 57 WPS is a C-17 flying unit, assigned to the USAFWS under Air Combat Command (ACC), flying Air Mobility Command (AMC) C-17s, and based at Joint Base (JB) McGuire-Dix-Lakehurst, NJ. The 57 WPS trains weapons officers who, upon graduation from the Weapons Instructor Course (WIC), will return to major commands with an operational C-17 unit. This arrangement is a complex one. When looking for potential efficiencies, the command relationship between the 57 WPS, AMC, and ACC become critically important.

There are a total of three USAFWS units training mobility air force weapons officers (WO); the 57 WPS trains C-17 WOs, 509 WPS trains KC-135 WOs, and the 29 WPS trains C-130 WOs. All three units share the complex command relationships, but their basing is slightly different. AMC decided to keep the 509 WPS and 29 WPS units at bases housing the actual aircraft the unit flies. The 509 WPS is at Fairchild AFB, WA and the 29 WPS is based at Little Rock AFB, AR. The 509 WPS uses on-loan aircraft based at Fairchild AFB. The 29 WPS uses on-loan C-130H aircraft based at Little Rock AFB

and uses on-loan C-130J aircraft from other wings (not at Little Rock AFB). Importantly, both of these units are now located at bases which fully support their training requirements with aircraft, maintenance, and operational training airspace, airfields, drop zones, etc. The 57 WPS is different. Like the 29 WPS C-130J aircraft, it uses on-loan aircraft from a geographically separated wing (62d Airlift Wing, Joint Base Lewis, McChord, WA). However, its mission does not align with the C-17 units already based at JB McGuire-Dix-Lakehurst. The support structure also does not align with the mission requirements. With the complexities of geography, different airframe and training requirements, and command relationships comes the opportunity for complex and wasteful processes. After nearly nine years of operations, another location may offer monetary savings and decreases in operations and maintenance temporary duty (TDY) days.

The 57 WPS is unique. It trains students to the extremes of aircraft and aircrew capabilities, building expert weapons officers. To fulfill this mission, they seek out challenging environments to meet the syllabus training requirements (USAFWS, 2010:55-63). It is impossible to find all these environments in the areas surrounding JB McGuire-Dix-Lakehurst. The type of flight operations described in the C-17 WIC syllabus require a large amount of airspace (volume and type), along with integrated operations with a variety of other units and aircraft (USAFWS, 2010:10). Due to the complex command relationships, there is a Concept of Operations (CONOPS) for AMC support to the 57 WPS (AMC, 2009:1). AMC supports the 57 WPS by providing on-loan aircraft for both syllabus and instructor continuation training purposes. Supporting C-17 wings provide three to four aircraft, 17 maintenance personnel, supply, and equipment, to

maintain, launch, and recover the aircraft anytime (and anywhere) they are in use by the 57 WPS (AMC, 2009:1-2). The responsibility to provide these aircraft rotates between AMC C-17 wings owning compatible aircraft (AMC, 2009:1).

The 57 WPS teaches one Weapons Instructor Course every six months, starting in January and July. Each course lasts 5 ½ months, graduating weapons officers the second week of June and December (USAFWS, 2010:10). Each course includes 24 flying sorties (48 in a calendar year) (USAFWS, 2010:12). 14 of the 24 syllabus sorties require deployment away from JB McGuire-Dix-Lakehurst to gain access to training areas required by the syllabus. This means 58.3% (28 of 48 annual sorties) of 57 WPS syllabus sorties require instructors, students, loadmasters, intelligence, and maintenance support to be on TDY status with the three or four aircraft. The extra flight hours and TDY costs (hotels, per diem, rental cars, etc.) consume precious resources; this resource burden is shared between ACC and AMC.

The student syllabus is broken up into six phases. The first three phases build the foundation for C-17 operations. Students start with the Advanced Tactical Maneuvering (ATM) Phase. During this phase they train to "execute, analyze and instruct C-17 performance and handling characteristics, formation management principles and low-altitude operations" (USAFWS, 2010:57). The second phase is the Defensive Tactics (DT) Phase during which the students learn to operate the C-17 against surface and air threats as a single aircraft and as a formation (USAFWS, 2010:58). ATM and DT Phases are typically flown from JB McGuire-Dix-Lakehurst. Following DT Phase, the students continue building the foundation for C-17 employment with the Aerial Delivery (AD) Phase. "The AD phase develops student skills necessary to execute, analyze and instruct

procedures for the two methods of C-17 aerial delivery, airland and airdrop, while employing in a low-threat environment" (USAFWS, 2010:59). This phase also provides the first opportunity for the students to plan and execute missions with U.S. Army and other U.S. Air Force assets. Three of the six AD Phase sorties are flown from JB McGuire-Dix-Lakehurst. The remaining three sorties are flown from Joint Base Elmendorf-Richardson, AK to allow the airdrop of actual personnel, container delivery system (CDS) bundles, and heavy equipment (HE) platforms.

The first three phases of the course build the foundation for the last three phases. The following phases provide opportunities for the students to apply what they have learned in more challenging environments and to develop and expand on their integrated operations skills with additional USAF and joint partners. The fourth phase of the course is the Direct Delivery (DD) Phase. This phase requires students to plan, analyze, execute and instruct missions using direct delivery concepts. This is primarily accomplished through sorties using high and low altitude ingress while operating in high pressure altitudes to drop zones and austere airfields (USAFWS, 2010:61). DD Phase is flown from Phoenix Mesa Gateway International Airport, Arizona (formerly Williams Air Force Base). The remainder of the course is flown from Nellis AFB and begins with Integration (INT) Phase. INT Phase synthesizes integrated USAF operations in a mature theater. INT Phase sorties include forced entry, combat airland, combat airdrop/resupply, noncombatant evacuation and humanitarian operations (USAFWS, 2010:62). The phase concludes with the Mobility Air Forces Exercise (MAFEX) where over 100 aircraft launch from across the continental United States (CONUS) to converge on the Nellis Test and Training Range (NTTR). Upon arrival, they integrate with combat air force (CAF)

assets for a joint forcible entry exercise (USAFWS, 2010:63). This is the largest MAF-centric exercise for the U.S. Air Force.

The final phase of the Weapons Instructor Course is the Mission Employment (ME) Phase. ME Phase further develops the students understanding and capability to employ with all the capabilities of MAF, CAF, and special operations forces (SOF). The sorties provide planning, execution, and debriefing training for offensive counter-air, defensive counter-air, and interdiction missions in a large-force integrated environment. The interdiction mission is subdivided into three emphasis areas, dynamic targeting, combat search and rescue (CSAR), and SOF (USAFWS, 2010:63). All ME Phase sorties are flown from Nellis AFB.

The 57 WPS also flies training sorties for instructor proficiency and currency. The CONOPS requires the 57 WPS to get most of its continuation training from Joint Airborne/Air Transportability Training (JA/ATT) missions (AMC, 2009:2). This requires the 57 WPS to align its training schedule with U.S. Army, Navy, or Marine Corps requested JA/ATT training. Unfortunately, due to the 57 WPS's rigid schedule this is rarely possible. AMC designated the 437th Airlift Wing (JB Charleston, South Carolina) as the supporting wing for 57 WPS continuation training when JA/ATTs are unavailable (AMC, 2009:2). Therefore, more often than not, the 57 WPS flies from JB McGuire-Dix-Lakehurst to JB Charleston, SC to gain the support required for continuation training. This constitutes about 3 hours of en-route cruise time for each aircraft, and provides one opportunity for AMC to avoid en-route flight costs.

Both instructor and syllabus training are costly to AMC and ACC. There may be opportunities to achieve economic efficiencies while maintaining or increasing unit

effectiveness through analysis. Today's budgetary environment requires all units to be as efficient as possible while retaining mission effectiveness. 57 WPS' operations may offer opportunities for increased efficiency. Changes to 57 WPS unit location and training areas may offer significant savings.

Research Focus

This research attempts to find efficiencies through an analysis of operational costs related to the basing location of the 57 WPS. Each basing location offers quantitative and benefits and costs associated with the available training locations. Some locations may be closer to certain training environments, offering efficiencies by a reduction in en-route flight time or TDY costs. The primary data includes monetary costs associated with flight hours and personnel TDY days. This research also attempts to identify other benefits associated with each basing location. The research will focus only on 57 WPS operations and not include other USAFWS squadrons or operations. Through a logical process, this research limits the field of potential bases to one alternate 57 WPS operating base. After selecting this alternate basing option, a cost analysis compares this base to JB McGuire-Dix-Lakehurst and identifies any potential efficiency gains achieved by relocating the 57 WPS. The primary goal of this study is to validate JB McGuire-Dix-Lakehurst as the optimal location for 57 WPS operations, or offer recommendations for an alternate basing option offering reduced cost, improved training opportunities, and potential gains in mission effectiveness.

Research Objectives/Questions/Hypotheses

This research study tries to answer the question, "What 57th Weapons Squadron basing location and training areas offer monetary and TDY rate savings for AMC and ACC while maintaining or increasing unit effectiveness?" The author hypothesizes that by identifying and quantifying the costs associated with 57 WPS cadre training and student syllabus sorties, significant savings are possible. If a TDY is required, positioning and de-positioning flight hours, per diem, billeting fees, and rental car fees become a factor. Each location may offer other benefits, such as integration opportunities with the host wing, efficiencies gained by closer proximities to other units for the purposes of missions such as airdrop, dissimilar air-combat training, escort, and close air support training. Combined, this information poses the opportunity to answer additional questions related to the primary research objective.

1) Will another C-17 base offer fewer TDY days for the 57 WPS cadre, students, or aircraft maintenance personnel compared to JB McGuire-Dix-Lakehurst?

2) If TDY days are reduced, does this offer mission related benefits beyond the decrease in personnel operations tempo?

3) Does a base other than JB McGuire-Dix-Lakehurst offer a lower cost in flight hour requirements for 57 WPS cadre and student training?

4) Can another base better utilize the on-loan 57 WPS aircraft when the 57 WPS is not using them?

The effort to answer all these questions leads to an overall basing recommendation with quantifiable savings and benefits for AMC and ACC.

Methodology

The data required for this research is primarily associated with C-17 flying hours and 57 WPS cadre, student, and aircraft maintenance personnel TDY costs. This research uses current training areas as a starting point, and expands the research to include other areas meeting the requirements for 57 WPS training sorties. This data is compiled in a spreadsheet. Each 57 WPS sortie type will be evaluated at that base. There are a total of 26 types of sorties: 24 student syllabus; and two instructor training sorties. Each sortie will be evaluated for training locations within a given distance from the home base. The 57 WPS routinely flies up to 1.5 hours to reach its training locations. Any areas beyond 1.5 hours typically require a TDY.

This study will use a cost-benefit methodology. More specifically, it will be a cost-minimization problem (covered later). Given the costs associated with each base, sortie, and training location, the author calculates a total flight hour cost and a total TDY cost (if required) for every training location option for each sortie. Once compiled, the author will determine a total cost associated with 57 WPS flight operations at the two home base locations.

Beyond the basic costs, the author will attempt to identify other efficiencies. These include limiting TDY days, decreasing student to instructor ratio, decreasing student TDY days away from the 57 WPS home base, increased utilization of on base

resources and exploitation of synergies gained through integration with the host base or nearby units.

Assumptions/Limitations

This research requires five basic assumptions. First, it is based on the 2009 AMC Concept of Operations and 2008 Execution Order. The researcher assumes that these remain current, as do any relevant Air Force Instructions, regulations, or other guidance cited within this paper. If the research or conclusions deviate from any official guidance, it will be specifically addressed and acknowledged at that point. Second, the research costs will be based on those available in December 2011. These include flight related costs (C-17 cost per flight hour, C-17 fuel burn rate, and contracted fuel costs per gallon) and TDY costs for personnel. If future 57 WPS operations are expected to deviate from 2011 operations, those differences will be identified. Third, the research will limit the basing options to include all continental United States (CONUS) active duty C-17 bases. It will deductively narrow the field of bases to one alternate base. Fourth, this study assumes that the host wing is willing to take on certain 57 WPS duties if the capability exists within the wing. These duties are really current operations functions which exist in a wing's operations support squadron and would not consist of additional duties. Rather they would integrate the 57 WPS into their current operations functions for actions such as airfield, low level, air refueling, and drop zone scheduling and deconfliction. Additionally, the wing is capable of using 57 WPS aircraft when not in use for syllabus or instructor training. Fifth, this research assumes there will be no significant increase to supply, logistics support, or maintenance facility costs.

The last point requires additional discussion to clarify the reasoning. Currently, the 57 WPS uses aircraft on loan from the 62^{d} Airlift Wing (AW), Joint Base Lewis-McChord, Washington. Maintenance support is provided by personnel TDY from the unit providing the aircraft (Eighteenth Air Force, 2008). JB McGuire-Dix-Lakehurst does not receive an increase in supply, logistics support, or maintenance facilities to support these aircraft. They are treated as transient aircraft merely occupying existing ramp parking spots. Importantly, if the 57 WPS were co-located with the wing which is tasked to provide the aircraft, then their existing personnel and infrastructure would continue to support the aircraft as if they were flown by the owning wing, but prioritized by an 18th Air Force – USAFWS memorandum of agreement. Therefore, there should be no significant increase in host wing costs as long as the 57 WPS is located at an existing C-17 base.

A second limitation of this research involves the calculation of flight hours. The author assumes that the time required to execute the objective portion of a training flight are the same, regardless of where the unit is located. For example, if the sortie requires dissimilar air combat training (DACT), then the execution of the DACT portion of that flight will not change due to unit location. Total flight time, comprised of the objective portion and en-route flight time may change due to an increase or decrease in the en-route portion. This is dictated by the proximity of the host wing to suitable airspace. Changes to the en-route flight time are the focus of this research effort. If a base allows a decrease in en-route flight time to reach an objective training area, savings in flight hour costs and fuel will result. To properly analyze the savings, the flight requirements for all 57 WPS sorties are analyzed through this research.

One final limitation of this study is the breadth of the analysis. This research will analyze the costs (flight hour costs, fuel costs, TDY day and monetary costs, etc.) associated with operations at JB McGuire-Dix-Lakehurst and one alternate location. The scope of the research is limited to one alternate location allowing an in-depth comparison between the two locations. The rational used to define the alternate location is described later in this paper. Additionally, this study will not attempt to identify the one-time costs associated with the permanent relocation of the squadron to another base. This is a very complex issue which may include permanent change of station (PCS) costs for some unit personnel, PCS and re-training costs for new or replacement unit personnel, movement of unit equipment, the construction or renovation of a new facility, and the purchase of any additional equipment required for the new facility.

Benefits/Implications of the Research

This research comes at a time when the Department of Defense faces budget cuts of up to $987 billion over the next ten years (Daniel, 2012). It identifies opportunities to avoid flight hour costs to AMC, while providing efficiencies in 57 WPS weapons officer production for ACC and AMC. AMC and ACC, as the 57 WPS' owning major command (MAJCOM), also avoid costs through the reduction in TDY days for the students (primarily AMC, but occasionally also Air National Guard, Air Force Reserve Command, Air Education and Training Command, and Pacific Air Forces) and the cadre (ACC). Currently, the USAF Weapons School is struggling to fund its 18 squadrons while standing-up new F-35, U-2, and CV-22 Weapons Squadrons. Any savings in 57 WPS operations could directly contribute to the production of more weapons officers in a

myriad of specialties. In addition to the savings mentioned above, the C-17 host wing may gain increased access to on-loan 57 WPS training aircraft while the wing's remaining aircraft are unavailable due to real world mission requirements. Furthermore, if the 57 WPS is able to realign its manpower workload, it may be able to decrease the ratio of students to instructors on a given day.

II. Literature Review

Previous Basing Research

Weapons Instructor Course (WIC) Site Matrix

There have been two different efforts to research the best location for the 57 WPS. First, there was an effort to quantify the benefits of each C-17 base when the unit was initially opened in 2003. Earlier, in 2001, AMC developed a spreadsheet which lists requirements for unit operations (WIC Site Matrix, 2001). The spreadsheet included two point papers providing information on a base's capability to meet certain unit requirements for Charleston AFB, SC (now JB Charleston) and McChord AFB, WA (now JB Lewis-McChord). Though this information was available at the time, the decision to base the 57 WPS at JB McGuire-Dix-Lakehurst was inconsistent with the results of the spreadsheet and point papers.

The Weapons Instructor Course (WIC) Site Matrix applies a weight factor (WF) to each of 13 unit requirements for the 57 WPS (see Attachment A). The WF indicates the relative priority among the requirements and is on a scale from one to five. A WF score of one indicates marginal impact and a score of five is mission critical (see

Attachment A, Notes). They include such topics as facilities, infrastructure, and operational flying requirements. Each base then receives a score called a compatibility factor (CF). The CF indicates the forecast ability for that base to meet the requirement. Multiplying the WF by the CF gives the base a score for each requirement. There are a total of 150 points available for each base. Dividing the points received by 150 total points offers a percentage based total capability rating. The scoring is represented by the following formula.

Equation 1: WIC Site Matrix Total Capability Rating Formula

$$Total\ Capability\ Rating = \frac{\sum_{n=1}^{13}(CF_n \times WF_n)}{150}$$

Where n = each requirement number from 1 to 13.

The matrix compares C-17 bases located at Charleston AFB, SC, McChord AFB, WA, McGuire AFB, NJ, Altus AFB, OK, and the Air National Guard base in Jackson, MS. The total capability ratings ranged from 26% to 93% and are represented in Table 1 below. Interestingly, though two bases (McChord AFB and Charleston AFB) exceeded the compatibility rating of McGuire AFB, NJ, it was still chosen as the location to stand up the 57 WPS. Furthermore, the research completed to build this matrix indicates that almost half the requirements for the 57 WPS would not be met if based at McGuire AFB (JB McGuire-Dix-Lakehurst). This suggests another location may be more appropriate for 57 WPS operations. If this is the case, AMC and ACC may be able to avoid certain costs by moving the 57 WPS to another location.

Table 1: C-17 Base Compatibility Ratings

Base	Total Compatibility Rating
McChord AFB, WA (JBLM)	93%
Charleston AFB, SC (JBC)	75%
McGuire AFB, NJ (JBMDL)	54%
Altus AFB, OK	51%
Jackson ANGB, MS	26%

Source: WIC Site Matrix, 2001

WIC Point Papers

The two point papers are attached to the WIC Site Matrix and offer more detailed information about Charleston AFB (now JB Charleston) and McChord AFB (now JB Lewis-McChord). JB Charleston offers three low level routes in the local area and many more within a 60 minute flight time. It has one auxiliary airfield for training and one co-located drop zone. Additionally, there are numerous air refueling wings which are able to support the three JB Charleston air refueling tracks (Charleston Air Force Base, 2001). While JB Charleston's Total Compatibility Ranking indicates it will be able to meet 75% of the 57 WPS requirements, the point paper articulates several shortcomings. While discussing a future facility for the 57 WPS, the paper states that "sufficient space is extremely questionable" (Charleston AFB, 2001). Furthermore, if the 57 WPS were based at JB Charleston, there would be "significant impact" to local training and long term billeting for the students is questionable (Charleston Air Force Base, 2001).

JB Lewis-McChord also submitted a point paper. With a compatibility rating of 93%, one would expect to find a more robust capacity to base the 57 WPS. As expected, JB Lewis-McChord mentions a variety of training airfields and airspace options. It describes the close relationship between the Western Air Defense Sector (WADS), 22nd Special Tactics Squadron, and the U.S. Army units, all co-located on JB Lewis-McChord (Davis, 2001:2). This is noteworthy because the 57 WPS would have access to joint training via airdrop and airland operations with the Army. To facilitate this joint training, JB Lewis-McChord offers 18 drop zones in the local flying area (Davis, 2001:2). Additionally, the Oregon Air National Guard flies F-15C aircraft which are required for 57 WPS DACT. The paper states that JB Lewis-McChord's aerial delivery operations have sufficient capacity to meet 57 WPS training requirements (Davis 2001:3). Fairchild AFB, WA hosts an air refueling wing and also the 57 WPS's sister squadron, the 509 WPS, flying KC-135 tankers. Additionally, Travis AFB, CA hosts KC-10 tankers and is a 90 minute flight away (Davis, 2001:3). Both tanker bases support JB Lewis-McChord's five air refueling tracks. Lastly, JB Lewis-McChord identified facilities that met or exceeded 57 WPS requirements and can host up to nine students in long-term billeting (Davis, 2001:1). The sole reservation in the paper cites a need to increase their training flying hours by 5% to provide the maintenance and spare aircraft the 57 WPS requires (this was the case at JB Charleston as well). Of note, the 57 WPS is allocated 1,300 flight hours for WIC operations, but a supporting wing must use its own flight hours to position aircraft for 57 WPS use (Appendix C). The point paper indicates a strong capability for JB Lewis-McChord to support 57 WPS operations. However, despite the point paper and

the 93% compatibility rating, JB McGuire-Dix-Lakehurst (with a 54% compatibility rating) was chosen over JB Lewis-McChord.

While AMC chose JB McGuire-Dix-Lakehurst as the host base for the 57 WPS, the author was unable to find a point paper describing its ability to meet 57 WPS requirements. Current research has uncovered no indication that a white paper was produced during the time AMC was making the basing decision. However, once the decision was made to base the 57 WPS at (then) McGuire AFB, a Site Activation Task Force addressed McGuire AFB's capability to meet 57 WPS requirements (AMC, 2003:1).

C-17 Weapons Instructor Course Site Activation Task Force

In 2003, an AMC Site Activation Task Force (SATAF) met at McGuire AFB to "support the bed-down of the C-17 Weapons Instructor Course" (AMC, 2003:2). It cites a variety issues and requirements in order to stand up the 57 WPS at McGuire AFB. One concern is aircraft availability. The SATAF noted the lack of aircraft support capability at McGuire AFB and cited a requirement for Charleston AFB and McChord AFB to provide aircraft for 57 WPS use. Interestingly, it states there is sufficient airspace, low level routes and drop zones in the local area for 57 WPS operations. The SATAF document is useful as it describes all infrastructure and other squadron requirements to support WIC operations.

C-17 WIC Relocation Brief

In 2008, Major Jeffrey Nelson (57 WPS operations officer) attempted to quantify savings associated with moving the 57 WPS from JB McGuire-Dix-Lakehurst to Nellis AFB or JB Lewis-McChord. He produced a Microsoft PowerPoint presentation with the goal of examining "the Long Term Operational Benefits and Return on Investment (ROI) of Relocating the 57th Weapons Squadron from McGuire AFB, NJ" (Nelson, 2008).

Major Nelson begins his argument by discussing 57 WPS operations and the positive and negative aspects of operating at JB McGuire-Dix-Lakehurst. Major Nelson notes that 14 of 24 sorties are flown at locations away from JB McGuire-Dix-Lakehurst, requiring post-mission crew rest which reduces instructor availability by 14 days per year (Nelson, 2008:5). During sorties flown from JB McGuire-Dix-Lakehurst, the squadron must utilize locations in North Carolina, Kentucky, and South Carolina to support the squadron's training requirements (Nelson, 2008:5). Conversely, Major Nelson notes JB McGuire-Dix-Lakehurst is open for 24 hour operations, has simulators available for use, and the 57 WPS instructors may fly with the host airlift wing (305 Air Mobility Wing) to maintain some of their currency (Nelson, 2008:5).

Beyond the flight operations, Major Nelson notes a challenge in integration between the 305 Air Mobility Wing (AMW) and the 57 WPS. Specifically he mentions the inability for the 57 WPS to utilize Standardization and Evaluation functions and the associated publications maintained by the 305 AMW (Nelson, 2008:5). This is because the 57 WPS is an airdrop qualified unit and the 305 AMW is airland qualified only. This

requires the 57 WPS to blend guidance from the 305 AMW and 437 Airlift Wing (located at JB Charleston) to execute the 57 WPS mission. Before beginning his analysis, Major Nelson describes the congested airspace around JB McGuire-Dix-Lakehurst and compares it to the relatively clear skies of the western states (Appendix B).

The document covers two possible courses of action (COA). COA #1 analyzes the benefit of moving the 57 WPS from JB McGuire-Dix-Lakehurst to Nellis AFB. Major Nelson chose Nellis AFB because it is the host base for the USAFWS, the 57 WPS parent unit. The analysis assumes all training is accomplished at Nellis AFB except for two weeks per year to support airdrop training. All aircraft and maintenance personnel would be on loan from the 62 AW from JB Lewis-McChord. While the TDY days required to support the syllabus and continuation training for the instructors would be decreased, all crewmembers would have to go TDY every quarter for two days to a base with a C-17 simulator. Major Nelson estimates the total savings to AMC and ACC would be $6.5M per year.

COA #2 analyzes the benefit of moving the 57 WPS from JB McGuire-Dix-Lakehurst to JB Lewis-McChord. Unique to this COA is the fact that the aircraft and maintenance personnel are home-based, decreasing TDY costs for the personnel and giving the 62 AW access to their aircraft when the 57 WPS is not using them. Since JB Lewis-McChord has C-17 simulators, the crewmembers would not have to go TDY to accomplish their quarterly training. However, students and instructors alike would be TDY from JB Lewis-McChord for 10 weeks per year to accomplish syllabus training at

Nellis AFB and Phoenix Mesa Gateway International Airport (Mesa), AZ. This option estimates the savings to AMC and ACC to be $6.2M per year.

Major Nelson concludes his analysis by recommending COA #1. He cites the increased return on investment ($6.5M versus $6.2M) as a primary consideration. Additional considerations include the benefit of being co-located with the 57 WPS chain of command and a significant decrease in TDY days (Nelson, 2008:23).

This research covers a broad range of TDY costs for 57 WPS cadre members, students, and 62 AW maintenance personnel. It also accounts for the cost of C-17 flight time to ferry the aircraft to and from JB Lewis-McChord as well as to and from deployed training locations. However, it does not account for any changes in cost associated with the syllabus or continuation training flights from either JB Lewis-McChord or Nellis AFB. Since the difference in savings between the two COAs is only $300K, there is an opportunity to further analyze and refine the conclusions of this research. Additionally, the analysis is limited to the two COAs mentioned above. It does not describe the rationale for considering these locations alone. While these two COAs appear to be logical choices, a discussion about the reasons other locations were not included may prove useful.

Cost Analysis

One type of cost analysis is a cost-benefit analysis (CBA). San Jose State University's Department of Economics offers a detailed explanation of CBA. The benefit of a cost-benefit analysis is that it offers a simple means of comparing one or more

options to determine which is most advantageous. Watkins describes CBA as a study which "estimates and totals up the equivalent money value of the benefits and costs to the community of projects to establish whether they are worthwhile" (Watkins, 2012). In 1848, a French engineer named Jules Dupuit developed CBA (Watkins, 2012). Later, a British economist, Alfred Marshall, formulated the basic concepts for CBA. However, the Federal Navigation Act of 1936 provided the foundation for the practical use of CBA (Watkins, 2012). This act required the U.S. Corps of Engineers to evaluate waterway projects to show the combined benefit "to whomsoever they accrue" outweigh the total cost of the project. As a result, the U.S. Corps of Engineers had to develop a systematic method to show both the costs and benefits of each project. Importantly, not all costs and benefits are easy to measure and may be measured in a variety of units (money, time, loss of life, etc.).

To properly measure the impact of a project, all variables, both positive and negative must be measured. These variables must be measured in a common unit, most often currency (Watkins, 2012). Currency is a unique unit because its value is not consistent over time. Therefore, a researcher must use values from a single time period, or correct the values over time to be equivalent to a single point in time (Watkins, 2012). For example, if the data were collected over 100 years, the researcher may need to correct for inflation. Additionally, if money were not spent on a project, its value may change due to its invested potential. To use the example of a 100 year project, a dollar spent 100 years ago may have a significantly different value than if it were invested. Expressing the

CBA in terms of a common unit like the U.S. dollar provides the study with a "bottom line" by which all options may be compared (Watkins, 2012).

Once a researcher quantifies optional outcomes, he or she must determine the impact of each option. "The *impact* of a project is the difference between what the situation in the study area would be with and without the project" (Watkins, 2012). A project is considered worthwhile if the net benefit exceeds the net cost. This project's focus does not conform to a traditional CBA because it looks at the costs associated with 57 WPS operations at different locations. Flight hours, fuel, and TDY costs are easily expressed in terms of money. However, other factors are more difficult. For example, what is the monetary benefit of decreasing a student to instructor ratio? A true CBA, using a single unit is a challenge in this case. A different type of cost analysis is required.

The U.S. National Library of Medicine (USNLM) offers a detailed description of differing types of cost analysis (USNLM, 2012). It suggests there are a variety of approaches to cost analysis and the purpose of the study and availability of the data may determine which approach is most appropriate (USNLM, 2012). The main types of costs analysis include the following (USNLM, 2012):

- *Cost-of-illness analysis:* a determination of the economic impact of an illness or condition (typically on a given population, region, or country) e.g., of smoking, arthritis or bedsores, including associated treatment costs
- *Cost-minimization analysis:* a determination of the least costly among alternative interventions that are assumed to produce equivalent outcomes

- *Cost-effectiveness analysis (CEA):* a comparison of costs in monetary units with outcomes in quantitative non-monetary units, e.g., reduced mortality or morbidity
- *Cost-utility analysis (CUA):* a form of cost-effectiveness analysis that compares costs in monetary units with outcomes in terms of their utility
- *Cost-consequence analysis:* a form of cost-effectiveness analysis that presents costs and outcomes in discrete categories, without aggregating or weighting them
- *Cost-benefit analysis (CBA):* compares costs and benefits, both of which are quantified in common monetary units

As mentioned earlier, a CBA may prove challenging for this study. However, the cost-minimization analysis (CMA) determines the "least costly" option with equivalent or improved outcomes. This study's goal is to determine whether an alternate location creates efficiencies (or lower costs) than current operations at JB McGuire-Dix-Lakehurst. The CMA offers the opportunity to look at current 57 WPS basing and compare it to alternate options. The primary means of evaluation will be monetary, but secondary benefits may be expressed in other ways. While a variety of bases may be able to support 57 WPS operations, this study sets a baseline for current operations and then compares other options to this baseline. The CMA will determine whether JB McGuire-Dix-Lakehurst or an alternative option provides weapons officers to the USAF at the lowest cost.

III. Methodology

Implementation of the Cost Minimization Analysis

The author uses a cost minimization analysis to compare 57 WPS operations at JB McGuire-Dix-Lakehurst to one other location. This analysis plans each 57 WPS cadre and student syllabus training sortie to ensure the training results in equivalent outcomes. Specifically, the 57 WPS cadre training must provide a similar or better training opportunity to that achieved at JB McGuire-Dix-Lakehurst. The analysis will not allow any degradation in student syllabus training. Degradation in training is considered any option which causes the deletion of a sortie from the syllabus or missing the objective of a given sortie. Therefore, in accordance with the USNLM's description of CMA, this study identifies the least expensive option for 57 WPS operations while maintaining an equivalent training environment.

Flight Hours

AMC currently allocates 1,300 flight hours per year to 57 WPS operations (Appendix C) (AMC, 2010). Each flight hour has a monetary cost. As of June, 2011, the cost to operate a single C-17 is $18,150 per hour (Moore, 2011:3). The flight hour cost is a combination of a variety of costs, both fixed and variable. If an alternate base requires fewer flight hours, multiplying the decrease in hours by $18,150 offers a monetary value to the flight hour savings. A portion of these savings are fixed. Due to this fact, the total flight hour savings is only one means of measuring the savings to AMC and ACC.

In an attempt to quantify the variable cost savings achieved by decreasing flight hours, the author will measure the fuel used in flight operations at different locations. The C-17 burns 2,860 gallons per hour (Fowler, 2011). The 2012 fiscal year fuel cost is $3.95 per gallon (Fowler, 2011). By multiplying these two values, one finds the C-17 costs $11,297 per hour in fuel for flight operations (see Table 2).

Table 2: C-17 Flying Hour Cost Summary

Value	Single Flight Hour Cost
Total Cost of a C-17 Flight Hour	$18,150 / hour
C-17 Fuel Burn Rate	2,860 gallon / hour
Aviation Fuel Cost (FY12)	$3.95 / gallon
C-17 Fuel Cost Per Hour	$11,297 / hour

Source: Fowler & Moore, 2011

The source of all C-17 flight hours supporting 57 WPS operations is important. As mentioned above, the 57 WPS is allocated 1,300 flight hours per year. This supports syllabus training and cadre currency. The wing which provides the on-loan aircraft to the 57 WPS is responsible for flying the aircraft to and from 57 WPS operating locations. The wing does this with its own flight hours. Therefore, this study will compute the cost of both 57 WPS and aircraft-providing wing flight hours. All flight hours are allocated by AMC. If the 57 WPS saves aircraft flight hours costs (returning them permanently to AMC), then this constitutes an avoided cost for the MAJCOM. AMC may elect to use the flight hours towards other requirements or reduce the overall hours, providing savings.

AMC is currently focusing heavily on fuel savings. Through working with the AMC fuel Efficiency Office, this research quantifies the fuel savings for an alternate basing option.

In 2008, the 18th Air Force Commander directed the 62 AW to provide all aircraft and maintenance support to the 57 WPS (18AF, 2008:1). Therefore, this study assumes all aircraft flight hours and maintenance support requirements are sourced from the 62 AW. Aircraft rotate between the 62 AW and the 57 WPS every 120 days due to a home station check (HSC) maintenance requirement. Therefore, 62 AW crews deploy and redeploy aircraft to and from 57 WPS operating locations as needed. The 57 WPS requires three aircraft for most sorties. The 57 WPS is no longer provided a maintenance spare aircraft (18AF, 2008:2). Therefore, when the 57 WPS requires a fourth aircraft (approximately once per phase), the 62 AW delivers the aircraft to the appropriate location for 57 WPS use and then return it to the 62 AW when 57 WPS training is completed. This rotation of aircraft is a cost to AMC. Limiting the unproductive flight hours required to deliver and return 62 AW aircraft supporting 57 WPS operations presents an opportunity for savings.

Terminology regarding savings or avoided costs is important when attempting to quantify the benefits of one base over another. There is a difference between the terms "savings" and "avoided cost." Avoided costs represent money that is no longer spent in one area, but will be used somewhere else. Thus, the savings is not returned to a higher headquarters or the Department of Defense. Conversely, savings represent costs that are no longer required and the money is returned to the higher headquarters or Department of Defense. AMC will likely view unused flight hours as an avoided cost because they can

re-allocate those flight hours elsewhere. This is also true to flight hours returned to the 62 AW (who currently supplies the aircraft to the 57 WPS). For the purposes of clarity, the author will refer to any decrease in requirements as a savings. This is because the decrease represents resources that are no longer required by the 57 WPS or 62 AW and are returned to AMC or ACC (as appropriate). When AMC or ACC weighs their options on the future uses of these savings, the MAJCOMs may decide to use them elsewhere, making the decrease in 57 WPS requirements an avoided cost from the MAJCOM's perspective.

Expected Flight Time

The expected en-route flight time to, between, and from training areas are computed by the author. As mentioned above, the flight time spent achieving training objectives in each training area is assumed to be the same for both locations. Therefore, the en-route time is the focus of this research. The en-route flight time is derived through the use of Combat Flight Planning Software (CFPS). The author will use the actual routing from 57 WPS sorties during the 11B (July – December 2011) to compute the JB McGuire-Dix-Lakehurst en-route flight time for each of the squadron's sorties.

Sorties originating from an alternate 57 WPS basing option require the author to identify suitable training locations and build the en-route flight path for each sortie in CFPS. Departures from an airfield are planned at 200 nautical miles per hour calibrated air speed (KCAS) until the first navigational aid (NAVAID). After that point, the aircraft is expected to fly at 250 KCAS at altitudes up to 25,000 feet and at mach 0.74 at altitudes

above 25,000 feet. The routing between the departed airfield and each training area follows a routing between suitable NAVAIDs along air navigation routes and is not planned "as the crow flies."

Once all routing for JB McGuire-Dix-Lakehurst and an alternate 57 WPS base is built in CFPS, the author will place the en-route times in a spreadsheet for use in computing en-route flight times and costs for all operations from each base. Once this is complete, the author may compare the two basing options and determine which base is the least costly for 57 WPS flight operations.

Temporary Duty Costs

There are several types of temporary duty (TDY) costs. AMC must pay TDY costs for the aircraft maintenance personnel and the students. ACC must pay TDY costs for the 57 WPS cadre. Within each category, the MAJCOM must pay costs associated with billeting, per diem, rental cars, and vehicle fuel. Regardless of the category, the research will not include costs that often vary by the individual such as laundry fees, taxi fees, baggage tips, etc. This study requires the author to address each type of TDY with separate TDY assumptions and calculations.

Before addressing the unique nature of each type of TDY, one must address aspects of the research that are standardized across all personnel. First, WIC classes are identified by the last two digits of the year and an "A" or "B" where "A" represents the first class of the calendar year and "B" represents the second class of the year. For example, WIC class 12A is the first class during calendar year 2012. For the purposes of

the research, the alpha (A) class starts on 5 January and concludes on 15 June. There is no accounting for the extra day during a leap year. The bravo (B) class begins on 5 July and finishes on 15 December.

During the course, the syllabus requires several flying deployments during four of the six course phases (AD, DD, INT, and ME Phases). The flying deployments incur TDY costs. This research assumes on base billeting will be used whenever facilities exist. There is no accounting for non-availability of on base billeting and the increased cost of off base commercial billeting. The length of the TDY for AD and DD Phase are flexible according to the number of sorties flown away from the 57 WPS home station. Each deployed day flight will require two TDY days. The first day is for planning and the second day includes the flight and debriefing. Deployed night flights require three TDY days. Like the day flights, the first day is for planning and the second day includes the flight. Due to the late night termination of the sortie, the debriefing will be held on the third day. A sortie may be flown on a deployment leg to a TDY location or on a re-deployment leg from a TDY location back to home station. In this case, the flight will include one TDY day and if the flight is on a re-deployment leg, there will also be one TDY day for planning. There is one exception for the fifth sortie in DD Phase where there are two days of preflight planning due to the complexity of the sortie. In addition to the TDY days to support flight operations, if a TDY is seven or more days long, one day off will be allowed for each seven days deployed. This caveat prevents excessive crew fatigue and an extra day for maintenance to perform more complex tasks if required.

INT and ME Phase TDY days will be static regardless of the number of flights. This is due to the integration requirements with the other USAFWS squadrons. INT Phase requires 21 days deployed to Nellis AFB, while ME Phase requires 14 days. ME Phase also includes the WIC graduation ceremony in Las Vegas, Nevada.

Personnel require rental cars at most locations. The rental car rates may vary depending on the location of rental, time of year, type of vehicle, and length of rental contract. Rather than induce a wide variety of variables, this research will use a single value for each model of rental car (minivan, truck, sport-utility vehicle, or sedan) based on a weekly rental rate. Portions of a week are prorated. The weekly rate and vehicle type is provided by The Nellis AFB Enterprise Rent-A-Car office. The data is provided in Table 3 below (Enterprise, 2011). This study assumes each vehicle uses one tank of gas per week and portions of a week are prorated. Fuel tank sizes are derived from Edmunds (Edmunds, 2011). Fuel costs are assumed to be static at $3.50 per gallon.

Table 3: Rental Cars and Associated Fees

Vehicle Type		Weekly Rate	Total (incl. Taxes & Fees)	Fuel Tank Size	Cost/Gal	Fuel Cost / Week
Type	**Model**	**$**	**$**	**Gallons**	**$/gal**	**$/week**
Car	Ford Fusion	$194.99	$250.63	17.5	$3.50	$61.25
Minivan	Dodge Grand Caravan	$290.99	$365.93	20.0	$3.50	$70.00
Truck	Chevrolet Silverado	$544.99	$670.98	26.0	$3.50	$91.00
SUV	Chevrolet Tahoe	$344.99	$430.78	26.0	$3.50	$91.00

Source: Edmunds.com and Enterprise, 2011

57 WPS Cadre TDY

57 WPS cadre deploy away from the home base when required to support student training. The 57 WPS is an ACC funded unit. The term cadre refers to the weapons officers (pilots), loadmasters, intelligence, and support personnel required to meet the students training requirements. Typically there are six WOs deployed on each phase.

Three to four WOs are assigned flying duties. There is one WO on standby in case another instructor is unable to fly (illness, family emergency, etc.). The sixth WO is the Phase Manager (PM). The PM accomplishes all the pre-planning, coordination, administration, and oversight duties. He/she typically works extremely long hours and does not fly. INT Phase requires a seventh WO. This extra person may fill several roles during the preparation and execution of the MAFEX. This individual may be the squadron commander (providing oversight or in an instructor role) or a WO who is the lead instructor (known as an instructor of record) for the entire exercise.

The loadmasters typically deploy five personnel. There is one Phase Noncommissioned Officer (Phase NCO) who works for the PM. The remaining four loadmasters are assigned flying duties. When there are only three aircraft flying, the fourth loadmaster functions as a standby loadmaster in the same role as the standby WO.

The 57 WPS intelligence flight deploys two personnel. They work daily in shifts to cover the requirements of the PM's future sortie planning as well as the student's current mission planning and briefing requirements.

Combined, the 57 WPS will deploy 13 personnel for each phase except INT Phase where there will be 14 personnel. All personnel will deploy from home station to a deployed location and then return to home station. Cadre members are paid 75 percent of the local meals and incidentals per diem rate for the first and last day of the TDY (JFTR, 2011:U4B-15). When the cadre members are billeted on a military base, they are given the proportional meals rate (USAFWS, 2010:2). The proportional meals rate is an effort

by the USAFWS to limit the cost of training for ACC funded units who are TDY to Nellis AFB. This research applies this standard to all 57 WPS per diem TDY costs.

While deployed for syllabus training, 57 WPS cadre require vehicles for both on and off-duty transportation. The WOs will have a two minivans and one sport-utility vehicle (SUV). The SUV is primarily for PM use. The loadmasters will have one minivan and one SUV. The SUV is primarily for the Phase NCO's use. The intelligence personnel will have one car. Lastly, when the 57 WPS is deployed to Nellis AFB, the squadron commander requires an additional sedan for official duties. Therefore, for each deployed phase, the 57 WPS rents three minivans, two SUVs, and one or two sedans.

WIC Student TDY

The WIC student TDY costs are different than the 57 WPS cadre costs. The students are funded by their owning unit. Though there are several squadrons that reside outside AMC (Air National Guard, Air Force Reserve Command, Air Education and Training Command, and Pacific Air Forces), this study will assume that AMC funds all student TDY costs because a majority of students will be stationed with AMC units. The students travel to and from the 57 WPS outside of the alpha or bravo course dates (listed earlier in this section). Therefore, they are considered TDY for all dates covered by this study and are not subject to the JFTR's 75 percent rule for the first and last day of their TDY (JFTR, 2011:U4B-15). They receive full per diem on all days, regardless of whether they are at the 57 WPS home base, or deployed to a training location away from the 57 WPS.

This research project assumes a WIC class of six C-17 students starts and completes the course (no accounting for attrition). If a base has billeting facilities, the students are billeted on base. They do not get rental cars when they are at the 57 WPS home station, but rent two minivans when they are at a deployed location. Importantly, 57 WPS students are authorized dual lodging when they are TDY away from the 57 WPS home base. Due to the length of their TDY, it is not practical for them to move in and out of a billeting room when they depart and return to the 57 WPS home station. Therefore, when they are away from the 57 WPS home station, they will be charged for the home station's billeting rate as well as the deployed location's billeting rate.

Aircraft Maintenance TDY

Aircraft maintenance personnel present a third variant of TDY costs. As mentioned earlier, they deploy whenever the aircraft are in use by the 57 WPS. This research assumes they are TDY to the 57 WPS at all times except from 16 – 30 June and 16 – 31 December. They are in place at all other times to meet WIC syllabus and 57 WPS cadre currency training requirements.

The 62 AW deploys 17 personnel to support C-17 maintenance requirements (AMC, 2009:6). The 17 personnel represent a broad spectrum of capabilities as is illustrated below in Table 4.

Table 4: Aircraft Maintenance Personnel Requirements

AFSC	Description	Number of Personnel
021A3	Aircraft Maintenance Officer	1
2A590	Pro-Super	1
2A573B	Avionics Maintenance	1
2A573A	Comm. and Navigation	1
2A551J	Crew Chief	4
2A571	Crew Chief	4
2A671A	Jets	1
2A655	Pneudraulic	1
2A676	Electronic and Environmental	1
2A656	Electronic and Environmental	1
2A672	Aerospace Ground Equipment	1
Total Personnel		**17**

Source: AMC, 2009:6

Maintenance personnel may swap out at any time, but are often TDY to support the 57 WPS for 45 or 60 days. This is somewhat unpredictable and becomes complex when attempting to account for the JFTR's 75 percent per diem rate on the first and last day of a TDY. Therefore, this research will assume full per diem for 17 maintenance personnel for the duration of their annual support requirement to the 57 WPS. The

maintenance personnel are not authorized dual lodging, and must check out of billeting any time they move operations to a different location.

The CONOPS for Aircraft Support for the C-17 WIC requires a metro, a four-person pickup truck, and a tow vehicle for flight line duties. Additionally, they require rental vehicles for personal transportation while off duty. This study assumes these requirements may be met by using dual-use vehicles. Therefore, the aircraft maintenance team will rent two six-passenger pickup trucks and two sport-utility vehicles at all locations to meet their flight line and off duty vehicle requirements.

Unit Stand-Up Issues

The cost associated with moving the 57 WPS is outside the scope of this research. However, it is useful to know the cost associated with initially standing up the 57 WPS. This information provides a theoretical return on investment if a location other than JB McGuire-Dix-Lakehurst is advantageous.

Headquarters AMC held a site activation task force (SATAF) from 28 – 30 October, 2002 at McGuire AFB. The SATAF was intended to "identify facilities, actions, and workarounds necessary to support the standup of the C-17 WIC at McGuire AFB" (AMC, 2003:2). The summary concludes it will cost $2,447,400 to fund the initial stand up of the 57 WPS at McGuire AFB (now JB McGuire-Dix-Lakehurst) (AMC, 2003:5). This conclusion is nearly a decade old. Therefore, we can use a conversion to adjust for the annual inflation from 2003 to 2012. The cost to standup the 57 WPS in today's dollars is $3,028,165 (InflationData.com, 2012). In the absence of a more detailed

analysis, the author will use this figure as an estimate for the cost to move and standup 57 WPS operations in a new location. If this study finds that moving the 57 WPS provides savings, then it can compare the savings to the standup cost to determine a return on investment (ROI).

Choosing an Alternate 57 WPS Basing Option

USAF C-17 Globemaster III aircraft are currently based at 13 different locations (see Appendix D) (USAF, 2012). As described above, the alternate basing options will be limited to CONUS active duty C-17 bases. Additionally, the 57 WPS is currently located at JB McGuire-Dix-Lakehurst, which does not have a C-17 airdrop mission. This means JB McGuire-Dix-Lakehurst cannot pack personnel parachutes or rig heavy equipment (HE) platforms and container delivery system (CDS) bundles. They also do not have the capability to control a drop zone or recover the HE platforms and CDS bundles after they are dropped on a nearby drop zone. This requires the 57 WPS to fly to JB Charleston for the unit's required airdrop training (AMC, 2009:2). Therefore, this study will only consider units that currently have an airdrop mission assigned to the base. This will limit the en-route C-17 flight hours the 57 WPS needs to execute their airdrop training mission.

The 57 WPS flies formation on nearly all of their sorties. The unit needs three to four aircraft to execute each sortie (AMC, 2009:1). Therefore, this research only considers bases with at least four available C-17 training aircraft. This limits the flight

hours required for a supporting base to enable 57 WPS operations by flying its aircraft to 57 WPS training locations.

These limitations leave only three alternate basing options, JB Charleston, Altus AFB, and JB Lewis-McChord (Appendix E). The 2003 WIC Site Matrix suggests Altus AFB has a very limited capacity to provide the aircraft, simulator, and aerial delivery support the 57 WPS requires (Appendix A). Additionally, Altus AFB falls under Air Education and Training Command and would require the complexity of adding coordination with a third MAJCOM (the others being AMC and ACC). Therefore, Altus AFB is eliminated as an alternate basing option.

The remaining two bases, JB Charleston and JB Lewis-McChord, are also the top scoring bases on the WIC Site Matrix. These two locations achieved the highest compatibility rating by a large margin (Appendix A). JB Charleston had a 75% total compatibility rating while JB Lewis-McChord achieved a 93% compatibility rating (Appendix A). The next closest base, JB McGuire-Dix-Lakehurst, only scored a 54% compatibility rating (Appendix A).

While the WIC Site Matrix favors JB Lewis-McChord over JB Charleston, it does not take into account the distance traveled to reach the 57 WPS training locations. These locations include Nellis AFB, Nevada; Mesa, Arizona; and JB Elmendorf-Richardson, Alaska. The 57 WPS deploys twice per year to Mesa and JB Elmendorf-Richardson. It deploys four times per year to Nellis AFB (USAFWS, 2010). The Combat Flight Planning Software (CFPS) estimates the time and distance a C-17 requires to fly between

JB McGuire-Dix-Lakehurst, the proposed alternate basing options, and the three training locations mentioned above. Table 5 illustrates the CFPS output and indicates that JB Lewis-McChord offers significantly shorter en-route flight times and distances when compared to either JB McGuire-Dix-Lakehurst or JB Charleston. Based on this information, this study will eliminate JB Charleston from further analysis and focus the remainder of the research on a comparison between JB McGuire-Dix-Lakehurst and JB Lewis-McChord.

Table 5: 57 WPS Basing Option En-Route Time and Distance to Training Location

	Basing Option		
Training Location	JB McGuire-Dix-Lakehurst, NJ	JB Charleston, SC	JB Lewis-McChord, WA
Nellis AFB, WA	4:30 En-route 1913 NM	4:05 En-route 1737 NM	1:44 En-route 734 NM
Mesa, AZ	4:17 En-route 1822 NM	3:45 En-route 1589 NM	2:17 En-route 965 NM
JB Elmendorf-Richardson, AK	6:53 En-route 2943 NM	7:19 En-route 3128 NM	2:59 En-route 1268 NM

Note: All times and distance represent a direct flight

Source: Author

Building the Data Set

Earlier sections of this paper describe the sources of data for this project. The complete data set for this study is a compilation all the data into a single Microsoft Excel spreadsheet. The spreadsheet includes six worksheets that build on the data from each other to form a conclusion based on a variety of factors. The following paragraphs will describe the six worksheets and then discuss the output generated from the worksheets.

The first worksheet builds the framework for the 57 WPS sorties and is titled "Sortie Hours." The worksheet is broken into three primary columns. The first column describes the steady state operations for the 57 WPS at JB McGuire-Dix-Lakehurst. The training locations are based on WIC class 11B's profiles and set a baseline which JB Lewis-McChord operations may be compared against. The next two columns describe operations at JB Lewis-McChord. This study will review two options for 57 WPS operations at JB Lewis-McChord. The first is considered a conservative option where the 57 WPS would operate out of JB Lewis-McChord, but continue to travel to all of the currently used deployed locations. This is considered conservative because it assumes that beyond relocation the squadron does nothing to increase the efficiency of their operations. This option does not preclude future efficiency increases that may be available, but does provide immediate-impact savings associated with re-basing flying hour program efficiencies.

The far right column represents an idealistic view of the potential for savings if the 57 WPS operates from JB Lewis-McChord. Due to the proximity to U.S. Army assets

(co-located at JB Lewis-McChord) and the nearby mountainous terrain, all sorties in the first four student phases depart and return to JB Lewis-McChord. This option is idealistic because it assumes access and participation by U.S. Army assets, nearby airspace and airfields, and other USAF units. These assumptions represent a "perfect world" answer which provides the upper bound of savings potential for this study. The only remaining deployments are during INT and ME Phase at Nellis AFB. These deployments remain a requirement to fulfill the USAFWS syllabus.

Table 6 (below) is an example of the worksheet described above. The light blue color describes the type of sortie. Student sorties also identify whether it is a day or night sortie by the addition of a "D" or a "N." This is used later to identify the number of days required to complete the sortie if it is at a deployed location.

Table 6: Sample 57 WPS Operating Base Sortie Hours Worksheet

Cadre Currency Sorties	JB McGuire-Dix-Lakehurst Based Flights			JB Lewis-McChord Based Flights (Keep TDYs)			JB Lewis-McChord Based Flights (Adapt TDYs)		
	Cadre Sortie	Airdrop Local w/ Tanker		Cadre Sortie	Airdrop Local w/ Tanker		Cadre Sortie	Airdrop Local w/ Tanker	
		En-Route Leg	Time (hrs)		En-Route Leg	Time (hrs)		En-Route Leg	Time (hrs)
		KWRI-KCHS	1.5		KTCM-AR307C	0.6		KTCM-AR307C	0.6
		KCHS-IR035	0.4		AR307C-IR326A	0.4		AR307C-IR326A	0.4
		KXNO-KCHS	0.3		IR326G-KMWH	0.2		IR326G-KMWH	0.2
		KCHS-AR777	1.3		KMWH-KTCM	0.5		KMWH-KTCM	0.5
		AR777-KWRI	0.4		Cruise/Aircraft	1.7		Cruise/Aircraft	1.7
		Cruise/Aircraft	3.9		Aircraft/Sortie	2.0		Aircraft/Sortie	2.0
		Aircraft/Sortie	2.0		Sorties/Yr	20		Sorties/Yr	20
		Sorties/Yr	20		Cruise/Yr	68.0		Cruise/Yr	68.0
		Cruise/Yr	156.0						
		Local Area Flight Only (No Tanker)			Local Area Flight Only (No Tanker)			Local Area Flight Only (No Tanker)	
		Cruise Leg	Time		Cruise Leg	Time		Cruise Leg	Time
		KWRI-SR846	0.3		KTCM-IR326A	0.8		KTCM-IR326A	0.8
		SR846-KNEL	0.1		IR326G-KMWH	0.2		IR326G-KMWH	0.2
		KNEL-KWRI	0.1		KMWH-KTCM	0.5		KMWH-KTCM	0.5
		Cruise/Aircraft	0.5		Cruise/Aircraft	1.5		Cruise/Aircraft	1.5
		Aircraft/Sortie	2		Aircraft/Sortie	2		Aircraft/Sortie	2
		Sorties/Yr	10		Sorties/Yr	10		Sorties/Yr	10
		Cruise/Yr	10.0		Cruise/Yr	30.0		Cruise/Yr	30.0

Source: Author

The en-route flight segments are listed next with the required hours (listed in hours and tenths of an hour) to perform each segment of flight. Below the en-route legs is

a summary of the information required to perform each sortie. The "Cruise/Aircraft" block summarizes the total cruise flight time required per aircraft. The following two blocks identify the number of aircraft required to complete that sortie's objectives and the number of sorties flown each year. The last block (Cruise/Yr) multiplies the "Cruise/Aircraft," "Aircraft/Sortie," and "Sorties/Yr" values to derive a total en-route flight time required to complete the sortie over the entire year (see Equation 2 below). One may note in Table 6 that airdrop sorties with a tanker requires 156 flight hours per year if based at JB McGuire-Dix-Lakehurst, while they only require 68 hours per year if flown from JB Lewis-McChord. Conversely, the JB Lewis-McChord based flights require 30 hours per year for a local area flight without a tanker, while the JB McGuire-Dix-Lakehurst sortie only requires 10 hours per year. Importantly, the flight time does not account for the training accomplished once the aircraft arrives at the training location. This is assumed to be the same regardless of the basing option. Therefore, these numbers cannot be used to identify an annual total flight hour requirement for the 57 WPS. Instead it represents a difference in requirements between each basing option.

Equation 2: Annual Sortie En-Route Flight Time

$$\frac{Sortie\ EnRoute\ Flight\ Time}{Year} = \left(\sum EnRoute\ Leg\ Flight\ Time\right)\ x\ \left(\frac{Aircraft}{Sortie}\right)\ x\ \left(\frac{Sorties}{Year}\right)$$

The completed worksheet is found in Appendix F. Once the worksheet encompasses all 57 WPS sorties, a summary output is produced at the top of the

worksheet. This will be discussed in a later section. The summary data is evaluated against the AMC cost for a C-17 flight hour and the fuel cost required to fly the sorties. An additional worksheet provides the data to compute the flight hour and fuel total costs.

The next worksheet simply feeds flight times to the Sortie Hours worksheet. It is titled "Flight Hour Tracker." The author uses CFPS and FalconView software to identify acceptable training locations based on syllabus requirements (USAFWS, 2010). Once all the locations for a sortie are identified, the author uses CFPS to specify the amount of flight time required to fly between locations and lists it in the worksheet in an hour and tenth of an hour format. The two worksheets are linked, so any update to the Flight Hour Tracker automatically updates the Sortie Hours worksheet.

The third worksheet also feeds data to the other worksheets. This worksheet is titled "Accounting Numbers." This is a catch all worksheet for the remaining input data values. It includes costs related to a C-17 flight hour including total flight hour cost, fuel burn rate per hour, and the cost of fuel during fiscal year 2012. The TDY costs (meals, incidentals, rental cars, and billeting) are listed for each possible deployment location in a separate section. The TDY costs are only meaningful if they are compared against a number of personnel and number of rental cars required for each phase. These values are also located on this worksheet. The completed worksheet is located in Appendix G.

The next two worksheets are similar. They use the TDY data from the Accounting Numbers worksheet and the number of day and night sorties from the Sortie Hours worksheet to calculate the TDY costs for the 57 WPS cadre, students, and aircraft

maintenance personnel. One worksheet is titled "ACC TDY Costs." It consolidates the TDY data for the 57 WPS cadre members. The students and aircraft maintenance personnel are funded by AMC. Therefore, the AMC TDY data is tabulated on a separate worksheet titled "AMC TDY Costs." Both of the worksheets pull data directly from the worksheets mentioned above. Appendices H, I, and J list the ACC TDY costs and Appendix K, L, and M list the AMC TDY costs. Appendices H and K represent the JB McGuire-Dix-Lakehurst baseline TDY data for ACC and AMC. Appendices I and J depict the TDY data if the squadron is based at JB Lewis-McChord, but retains all current TDY deployments. Lastly, Appendices J and M represent the squadron's TDY costs if the 57 WPS moves to JB Lewis-McChord and adjusts the TDY requirements.

Earlier sections of this paper describe the costs associated with the cadre, students, and aircraft maintenance personnel. The cadre incurs billeting, per diem, and rental car costs to ACC when deployed during AD, DD, INT, and ME phases. AMC pays student billeting costs at JB McGuire-Dix-Lakehurst for the duration of the class. When deployed away from JB McGuire-Dix-Lakehurst, AMC pays student billeting, and rental car fees. The students are paid per diem based on the location they are at the time (deployed or at JB McGuire-Dix-Lakehurst). Finally, AMC pays billeting, per diem, and rental car fees based on where the aircraft maintenance personnel are TDY at the time. JB Lewis-McChord currently supplies the aircraft and maintenance personnel to support 57 WPS operations. Therefore, aircraft maintenance personnel will not incur TDY costs when operations are located at JB Lewis-McChord. Based on this information, several equations build upon the information in the other worksheets to find total costs for per

diem, billeting, and rental cars for each phase. These are combined to show a total cost per year for AMC and ACC. Equation 3 through Equation 6 depict the formulas used to develop the cost for the appropriate locations.

Equation 3: ACC Deployed Per Diem Cost Formula

$$ACC\ Per\ Diem\ Costs = [(\#\ Personnel)(\#\ TDY\ Days - 2)(Meal + Incidental\ Rate)] + [(\#\ Personnel)(2\ x\ 0.75)(Meal + Incidental\ Rate)]$$

Equation 4: AMC Student Per Diem Cost Formula

$$AMC\ Per\ Diem\ Costs = [(\#\ Personnel)(\#\ TDY\ Days)(Meal + Incidental\ Rate)]$$

Equation 5: ACC and AMC Billeting Cost Formula (All Personnel)

$$Billeting\ Costs = [(\#\ Personnel)(\#\ TDY\ Days)(Billeting\ Rate)]$$

Equation 6: ACC and AMC Rental Car Cost Formula

$$Rental\ Car\ Costs = \left(\frac{\#\ TDY\ Days}{7}\right)[(\#\ Cars\ x\ Car\ Rate) + (\#\ Minivans\ x\ Minivan\ Rate) + (\#\ SUVs\ x\ SUV\ Rate) + (\#\ Trucks\ x\ Truck\ Rate)]$$

The ACC and AMC TDY Data worksheets have one more section which utilizes the information from the equations above. At the top of each worksheet is an area that

summarizes the costs, TDY days, and post-mission crew rest (PMCR) days required to support 57 WPS operations each year. The PMCR days are time off of work "to recover from cumulative effects of the mission and tend to personal needs" (AFI 11-2C-17v3, 2011:31). PMCR is required for each aircrew member based on the number of days he/she is TDY. AFI 11-2C-17v3 awards one hour of PMCR for every three hours TDY (AFI 11-2C-17v3, 2011:31). The maximum PMCR is 96 hours (AFI 11-2C-17v3, 2011:31). The ACC TDY Data worksheet approximates the PMCR rule by awarding one day of PMCR for every three days TDY. The maximum number of PMCR days allowed is four. The worksheet tabulates the number of PMCR days for WOs only. If one basing option allows for fewer PMCR days, this correlates to additional days the WO is available to instruct the students and represents an improvement in student training.

The final worksheet is titled "Results Summary." This worksheet pulls information from the Sortie Hours, ACC TDY Data, and AMC TDY Data worksheets. The worksheet has three columns and is similar to the Sortie Hours worksheet. The far left column lists data-based results of current JB McGuire-Dix-Lakehurst operations. The remaining two columns use this data to tabulate savings in a few cells of each column. The center column displays the costs and summarizes the savings if the 57 WPS is moved to JB Lewis-McChord and the 57 WPS continues to use the current model of TDY training locations. The third column is the idealist solution, depicting costs and summarizing savings if the 57 WPS moves to JB Lewis-McChord and limits the TDYs requirement.

The worksheet is vertically divided into five sections. The first section summarizes the AMC flight hours for each basing option. It shows the savings achieved or costs incurred in flight hours if the 57 WPS is moved to JB Lewis-McChord compared to the JB McGuire-Dix-Lakehurst baseline. The second and third sections display the AMC TDY costs/savings and manpower costs/savings for each column. The TDY costs/savings are represented in terms of U.S. dollars. The manpower costs/savings describe the number of TDY days for students and aircraft maintenance personnel. A decrease in TDY days represents more maintenance personnel availability for the 62 Airlift Wing when they are not supporting 57 WPS operations. A decrease in student TDY days represents additional days the students may receive classroom training while still meeting their flying training requirements.

The fourth section is similar to the second and third sections, but it summarizes TDY costs/savings and manpower costs/savings for ACC based on the 57 WPS cadre TDY information. A reduction in TDY costs represents a savings for the 57 WPS and these funds may be returned to the USAFWS to meet other requirements. A reduction in TDY days indicates in increase in available manpower in the squadron. This manpower may be used to increase the quality of student training through a decreased student to instructor ratio, increased instructor availability for extra instruction, or increased opportunity for instructors to work on any additional duties. Additional duties may include planning for future flying phases, academic course revisions, and other required squadron duties.

The final section is a “Bottom Line” assessment. It summarizes the worksheet into a smaller block. This summary provides the final take-away details of the analysis. It combines the ACC and AMC monetary and manpower costs/savings into one section.

The paragraphs above describe the data collection and computation required to determine the optimal location for 57 WPS operations. The data is collected from a variety of sources and combined into one location for analysis. The following chapter describes the results of this analysis.

IV. Analysis and Results

Chapter Overview

Chapter III described how the data were collected, placed into spreadsheet workbooks, and combined into useful information. This chapter describes the results of this research as it applies to the research questions in Chapter I. The sections below detail the results of the sortie flight hour analysis. It then describes the results of the TDY cost analysis for AMC and ACC. Finally, it provides an overview of the final results.

Sortie Flight Hours Comparison

The flight hours computations yield interesting data points. The results are depicted in Appendix P. The flight hours are all funded by AMC, so the 57 WPS flight hour savings are returned to AMC or to the 62 AW at JB Lewis-McChord for those hours the 62 AW uses to fly aircraft to the 57 WPS or return them to JB Lewis-McChord for maintenance.

The results indicate that by simply moving the 57 WPS to JB Lewis-McChord the en-route flight time is reduced from 838.7 hours to 403 hours, a reduction of 435.7 flight hours (Appendix P, second column). 68 of the saved flight hours are derived from a decrease in cadre training en-route flight time. The remaining 367.7 saved flight hours are achieved through a reduction in student training en-route flight time (218 flight hours) and a decrease in the 62 AW flight hours required to support the 57 WPS (149.7 flight hours). Combined, these savings represent a $7.9 million reduction in AMC's flight hour support costs for 57 WPS operations. While a portion of the $7.9 million is considered a fixed cost, the fuel burned is a variable cost. Based on the fuel calculations described earlier in this paper, AMC can expect to save $4.9 million in fuel requirements alone if these 57 WPS and 62 AW flight hours are eliminated.

The results also identify savings if the 57 WPS moves to JB Lewis-McChord and is able to maximize the training flown from JB Lewis-McChord while decreasing TDYs as much as possible. The third column represents flight hour costs with all phases flown from McChord Field except INT and ME Phases, which must be flown from Nellis AFB. This metric can be viewed as top-end figure for 57 WPS operations if the squadron was able to achieve all possible flight hour reductions identified in the Sortie Hours worksheet. The results show the squadron may reduce en-route flight time from 838.7 flight hours to 343 flight hours, a savings of 495.7 C-17 flight hours. The 57 WPS cadre training reduction remains the same as the previous paragraph's results at 68 flight hours. However, the 62 AW increases its savings to 165.9 flight hours and the 57 WPS increases its savings to 261.8 flight hours. Combined, the reduction of flight hours required to

support 57 WPS operations is equivalent to $9.0 million in C-17 flight hours. Fuel represents $5.6 million of the flight hour savings.

The flight hour savings described above indicates that a 57 WPS move from JB McGuire-Dix-Lakehurst to JB Lewis-McChord will reduce AMC resources required to support C-17 flight hours. The flight hour results are summarized below in Table 7. The flight hours represent the largest portion of 57 WPS operational costs. However, the TDY costs in terms of money and manpower are also important to understand the full impact of a squadron move to JB Lewis-McChord.

Table 7: Flight Hour Results Summary

	JBMDL	JBLM (Keep TDYs)			JBLM (Adapt TDYs)		
	Baseline Hours	Hours	Delta from Baseline	$ Hour Savings (Fuel Savings)	Hours	Delta from Baseline	$ Hour Savings (Fuel Savings)
Cadre Training	166.0	98.0	68.0	$1.23M ($0.77M)	98.0	68.0	$1.23M ($0.77M)
Syllabus Training	493.2	275.2	218	$3.96M ($2.46M)	231.4	261.8	$4.75M ($2.96M)
62 AW Support	179.5	29.8	149.7	$2.72M ($1.69M)	13.6	165.9	$3.01M ($1.87M)
Total	**838.7**	**403.0**	**435.7**	**$7.91M ($4.92M)**	**343.0**	**495.7**	**$9.00M ($5.60M)**

Source: Author

AMC TDY Costs

The results of the AMC TDY Costs worksheet identify opportunities for increased efficiency. All measured factors showed efficiency gains if the 57 WPS moves to JB Lewis-McChord. Furthermore, if the squadron were able to limit the TDY flight phases to only INT and ME Phase, even more efficiencies are possible. The results are summarized in Appendix Q. If the 57 WPS moves to JB Lewis-McChord, AMC will save

$738 thousand. A majority of these savings is due to a $729 thousand decrease in aircraft maintenance TDY spending. AMC also will see a nine thousand dollar reduction in student TDY costs.

The data shows that the 57 WPS can achieve further savings for AMC by limiting TDY training. In the ideal situation described in earlier paragraphs, student TDY savings increases to $31 thousand and aircraft maintenance TDY savings increases to $825 thousand. AMC's total TDY savings reaches approximately $857 thousand.

The results show savings for all TDY personnel if the 57 WPS relocates to JB Lewis-McChord (Appendix O and Q). The monetary savings are a result of a decrease in TDY manpower requirements for students and aircraft maintenance personnel.

AMC Manpower Costs

The trend seen in the previous two sections continues with the AMC manpower cost results. Again, in all measured areas, there is a reduced impact to students and aircraft maintenance personnel if the 57 WPS is based at JB Lewis-McChord. The results of this research are depicted in Appendix R. Students are TDY from their home unit 326 days per year. Currently, they are TDY to locations other than the 57 WPS for 112 days per year. Aircraft maintenance personnel are TDY 335 days per year and spend the same 112 days to locations other than the 57 WPS to support flying operations.

If the 57 WPS is based at JB Lewis-McChord, there is an opportunity to fly certain sorties that currently require a TDY from home station. The squadron is still

expected to deploy for portions of AD and DD and all sorties during INT and ME Phases, but the author took advantage of obvious efficiencies for individual sorties at JB Lewis-McChord. This is due to the availability of training airspace and airfields currently in use by JB Lewis-McChord C-17 aircrews. Students remain TDY to the course for 326 days per year (163 days per semi-annual class). However, students are now only TDY from the 57 WPS home base for a total of 100 days per year. This provides 12 additional days the students are available at the 57 WPS for additional academic instruction and represents an 11% improvement.

Aircraft maintenance personnel see an even greater improvement. Currently aircraft maintenance personnel are TDY from JB Lewis-McChord to JB McGuire-Dix-Lakehurst, or any location the 57 WPS deploys to from JB McGuire-Dix-Lakehurst. By moving the 57 WPS to JB Lewis-McChord, the aircraft maintenance personnel are only TDY when the squadron operates out of locations other than JB Lewis-McChord. The aircraft maintenance TDY days decrease to 100 and now mirror the student TDY days from JB Lewis-McChord. This is a 235 TDY day reduction for the aircraft maintenance team and returns 3,995 man-days of maintenance capability to the 62 AW.

As the 57 WPS adapts the syllabus TDY requirements, even more savings are possible. Student and aircraft maintenance personnel TDY days away from JB Lewis-McChord may decrease to as few as 70 days. This provides 42 additional home station student training days at the 57 WPS and is a 38% improvement. The aircraft maintenance team will reduce their TDY days by 265 and return 4,505 maintenance man-days to the 62 AW.

The improvements outlined above conclude the analysis of the impact to AMC if the 57 WPS moves to JB Lewis-McChord (Appendix O and Q). The data indicates AMC will find efficiencies in flight hours and TDY costs (monetary and manpower) by through a change in 57 WPS operating location.

ACC TDY and Manpower Costs

The previous sections outline the savings achieved by AMC if the 57 WPS moves to JB Lewis-McChord. However the 57 WPS is an ACC unit. Therefore, ACC savings are equally important in the decision to move the squadron. The results of the ACC TDY cost data are consistent with the AMC data due to a decrease in TDY days resulting from a 57 WPS move to JB Lewis-McChord.

Currently, 57 WPS personnel are TDY for 112 days per year at a cost of $212 thousand. As described in the AMC sections above, a squadron move to JB Lewis-McChord reduces the TDY days to 100 at a reduced cost of $184 thousand. This is a reduction of $28 thousand (13%) and 12 TDY days per squadron member (11%) overall. In addition to the 12 days the cadre members are no longer TDY supporting flying operations, there are post-mission crew rest savings. As a result of the decrease in TDY days, the PMCR requirement decreases as well. This is important because the instructors are not available for student training during PMCR periods. The decrease in TDY days returns 24 weapons officer instructor man-days to the 57 WPS (Appendix N and S).

Similar to previous sections, the adaptation of 57 WPS TDY sorties creates further efficiencies. Like the students and aircraft maintenance personnel, the TDY days

decrease to 70, a reduction of 42 days (38%). The costs fall to $112 thousand, representing a $99 thousand (47%) decrease compared to current operations. PMCR instructor man-days returned to the 57 WPS increases further to 84 man-days.

Results Summary

The results of all measured data indicate there are significant efficiencies gained by moving the 57 WPS to JB Lewis-McChord. Both ACC and AMC realize monetary and manpower savings, or may reallocate these savings to other endeavors. AMC's savings are greater due to the high cost of a C-17 flight hour and the high TDY rate of the students and aircraft maintenance personnel. However, ACC's savings are significant given the small size of the 57 WPS (25 personnel).

V. Conclusions and Recommendations

Conclusions

The data clearly shows the ACC and AMC efficiencies gained by operating the 57 WPS mission from JB Lewis-McChord and by optimizing the syllabus for that location. AMC will recoup between $7.9 and 9.0 million in flight hours and between $738 and $857 thousand in TDY costs. The 57 WPS trains weapons officers for the USAF. AMC is the primary customer for C-17 weapons officers and therefore will reap the benefit of between 12 and 42 additional academic training days for their new weapons officers.

AMC's 62 AW will also see several benefits. By moving the 57 WPS to JB Lewis-McChord the 62 AW will be able to better use between 149.7 and 165.9 flight

hours for local aircrew training rather than 57 WPS support. The wing will also see at least a 3,995 man-day improvement in aircraft maintenance personnel availability at JB Lewis-McChord. There is also one subtle benefit. The aircraft the 57 WPS utilizes will be located at their owning base. It removes the requirement to rotate the aircraft back to the owning base for home station maintenance checks and allows the owning wing's maintenance personnel full time access to the aircraft. Furthermore, the AMC CONOPS requires that "while aircraft are on loan to the USAFWS, every effort will be made to utilize the aircraft to the maximum extent possible when they are not directly supporting the WIC" (AMC, 2009:4). JB McGuire-Dix-Lakehurst only has two C-17 squadrons (one active and one reserve), while JB Lewis-McChord has seven C-17 squadrons (four active duty and three reserve). This gives a larger pool of aircrew access to the aircraft when they are not in use by the 57 WPS.

The 57 WPS benefit from being co-located with the 62 AW. The 57 WPS could take advantage of capabilities already in place to aid in deconfliction, scheduling, and standardization and evaluation functions. This will further decrease the non-instructional duties for the WO's and present opportunities for increased instruction for the students.

ACC and the USAFWS also reap benefits from moving the 57 WPS. The $28 to $99 thousand reduction in TDY costs may be reallocated to increase USAFWS training capability, help fund one of the other 17 USAFWS squadrons or offset the impact of the current and future Department of Defense budget cuts.

This study began by asking the question, "What 57th Weapons Squadron basing location and training areas offer monetary and TDY rate savings for AMC and ACC while maintaining unit effectiveness?" The research described above does not remove any flight training and actually indicates the potential to increase the available academic training days for future USAF weapons officers. While maintaining current training capability, the results describe an opportunity for significant efficiency gains.

Chapter I also outlines four additional questions for this research. As described above, the results of the data analysis indicate:

1) JB Lewis-McChord offers fewer TDY days for 57 WPS cadre compared to current operations at JB McGuire-Dix-Lakehurst
2) The reduction of TDY days creates additional instructor and student availability for academic instruction at the 57 WPS.
3) JB Lewis-McChord offers a decrease in cadre and student training flight hour costs of at least $7.9 million per year.
4) JB Lewis-McChord has a larger aircrew force that may be able to better utilize on-loan 57 WPS aircraft when they are not in use for WIC sorties.

The combined results of this study make a strong case advocating for a 57 WPS move from JB McGuire-Dix-Lakehurst to JB Lewis-McChord. Added together, the total 57 WPS savings achieved through a unit move to JB Lewis-McChord will be at least $8.7 million and as high as $10.0 million. Despite the savings potential, there are a few limitations worth mention before providing a final recommendation.

Limitations

This research project is necessarily limited in scope. The study focuses on the flight operations of the 57 WPS; however it does not cover all TDY requirements for the squadron. Both students and cadre members travel in TDY status for non-flying syllabus requirements or conference attendance. This study does not analyze the costs associated with non-flying TDY travel, which are assumed to be similar for all base locations.

The savings described in the results section are an academic effort. That is to say that the real-world results may vary as 57 WPS operations are impacted by outside influences. If the squadron adjusts the way it flies some or all the syllabus sorties, it could have an impact on the results described above. If those adjustments do not align with this study, the flight time and TDY requirements must be re-analyzed to determine the cost impact of that decision. Furthermore, issues such as student failures or inclement weather may require the 57 WPS to re-fly a sortie. This incurs an additional cost that is not reflected in this study. However, these impacts are to be expected at either JB Lewis-McChord or JB McGuire-Dix-Lakehurst.

Lastly, this research project provided a cost minimization analysis to determine the least costly location for 57 WPS operations. While the potential efficiencies are described in the previous chapter, this study does not address the costs associated with moving the 57 WPS. There will be infrastructure costs as well as costs to move the personnel who man the squadron. Therefore, the savings must be compared against the cost to move the squadron to determine a return on investment (ROI). While the cost is

not part of this study, the C-17 WIC SATAF helps estimate the ROI. As described in Chapter III, the bed-down of the 57 WPS was expected to cost approximately $2.4 million in 2003 dollars. That equates to just over $3.0 million in 2012 dollars (InflationData.com, 2012). If the $3.0 million estimate is compared against the savings achieved by moving the squadron, one may estimate the ROI. As mentioned earlier, the flight hour cost includes fixed and variable costs, while the fuel cost is variable and is saved if they aircraft are not flown. Therefore, using the minimum fuel savings found in Chapter IV ($4.9 million per year), one may estimate the ROI will be approximately 0.61 years, or a little over seven months ($3.0 million divided by $4.9 million). Therefore, AMC can expect to achieve a return on the estimated $3.0 million approximately seven months after the squadron's move is complete. After that point, AMC will receive the full effect of the efficiencies described above.

Recommendations

The results of the data analysis in this study all point to a single recommendation. ACC and AMC must coordinate to move the 57th Weapons Squadron from JB McGuire-Dix-Lakehurst, NJ to JB Lewis-McChord, WA. In doing so, AMC will reduce its annual flying hour support requirement for 57 WPS operations by at least $7.9 million ($4.9 million in fuel). AMC will reduce its TDY costs by at least $738 thousand while ACC will reduce its TDY costs by at least $28 thousand.

AMC will also realize benefits through 12 additional academic training days for the students and the return of at least 3,995 maintenance man-days to the 62 AW.

Similarly, ACC will reduce the 57 WPS cadre TDY requirement by at least 12 days and gain 24 man-days of instructor availability due to a decrease in PMCR days. These results are summarized in Appendix T.

Recommendations for Future Research

This study's effort to identify the location which minimizes the cost of 57 WPS operations reveals the costly nature of USAF flight training. The flight hour savings were found by limiting the en-route flight time for the training sorties. This en-route flight time can also be described as non-productive flight time and then applied to training and operational flight hours. A well researched reduction in non-productive flight time will lead to overall savings while retaining mission effectiveness. This study's effort to reduce non-productive flight time partially required a change in unit location, though that is not a requirement to find savings in all units.

There may be other opportunities to realign unit basing to achieve efficiencies. This will likely be a great challenge for larger units as it may draw larger political interest or cause undesirable strategic impact. Other researchers may find efficiencies by looking at the training and operational roles within a unit. There may be opportunities to consolidate a capability or training requirement in one location and achieve economies of scale.

Lastly, the return on investment described earlier is merely an estimate. It used the costs associated with 57 WPS bed-down at JB McGuire-Dix-Lakehurst in 2003 to estimate the bed-down costs at JB Lewis-McChord in 2012. Further research is required

to identify a return on investment based on JB Lewis-McChord's infrastructure and ability to bed-down the 57 WPS. Additional research is also needed to study the requirement to move personnel to JB Lewis-McChord and the impacts it may have on individuals and their careers.

Summary

The Department of Defense faces nearly one trillion dollars in budget cuts in the next year. This study identifies significant efficiencies by relocating a squadron of only 25 personnel. In doing this, it maintains and will likely increase unit mission effectiveness. Importantly, the results of this study indicate the potential for significant and repeating annual efficiencies for both ACC and AMC for an investment that will likely be repaid in only seven months.

This study is more important today than ever before in the history of the 57 WPS. As budgets decrease, it becomes more difficult to provide the same capability for a reduced cost. The movement of this small unit will increase the quality of C-17 weapons officer training while creating lasting savings for two MAJCOMs.

Appendix A – WIC Site Matrix

Table 8: WIC Site Matrix (1 of 2)

WIC Requirements as of: Feb-12	Charleston	Score	McChord	Score	McGuire	Score	Altus	Score	Jackson	Score
1. AIRCRAFT. Requires use of 3 to 4 aircraft for training and employment missions. The WIC will deploy for 7 to 10 days semiannually. Consideration must be given to impact on currently programmed wing mission requirements (TWCF, SOLL II, PNAF, etc.) (WF = 5)	Requires 6-8% of planned PAA. Other msns: CT, SOLL II, Lofty Crown, JA/ATT and TWCF. CF = 2	10	Requires 6-8% of planned PAA. Other msns: CT, PNAF, Deep Freeze, JA/ATT and TWCF. CF = 3	15	Requires 25-33% of planned PAA. Deliveries not scheduled to begin until FY04. Other msns CT and TWCF. **CF = 1**	5	Requires 37-50% of PAA. No excess capacity over current PFT **CF = 0**	0	Requires 50- 66% of planned PAA. Other planned msns: CT and TWCF. **CF = 0**	0
2. OFFICE SPACE. Requires approximately 10,000 sq. ft. net total for operational requirements (WIC Space Req). This is not required to be new MILCON to commence operations. (WF = 5)	Existing & planned facilities "extremely questionable" CF = 1	5	Several existing facilities meet or exceed criteria CF = 2	10	Existing & planned facilities questionable. **CF = 1**	5				
3. BILLETING. Requires extended-stay (5 and ½ months) arrangements for up to eight students. Rooms should include the ability to store and prepare food and study area. (WF = 3)	Questionable for extended-stay CF = 1	3	Supportable on base. CF = 3	9	Supportable on base. **CF = 5**	15	Supportable on base. **CF = 5**	15	Questionable for extended stay. **CF = 0**	0
4. BASE OPERATING SUPPORT (BOS)/QUALITY OF LIFE. The host wing must be capable of providing the standard services provided to Air Force active duty members and their dependents. (WF = 4)	Adequate facilities **CF = 3**	12	Adequate facilities **CF = 3**	12	Adequate facilities **CF = 3**	12	Adequate facilities **CF =3**	12	Extremely limited facilities **CF = 1**	4
5. SIMULATOR/CBTs. Course requires a specified (TDB) amount of simulator-based training. WIC staff requires 384 hours annually for pilot & loadmaster training requirements. (WF = 5)	3 Simulators by FY03 CF = 3	15	3 Simulators by FY04 CF = 3	15	Simulator expected by FY05. **CF = 0**	0	4 simulators by FY02. No excess capability over PFT. **CF = 0**	0	Simulator expected by in FY04/1. Only using 20% of capability. **CF = 3**	15
6. FLYING HOURS. Requires set amount of hours for student training. Current estimate is 800 hours annually for the academic course. The WIC staff requires an estimated 460 hours annually for aircrew currency training requirements. These hours are currently unfunded for FY03. (WF = 5)	Forecast 5 – 10% TTF increase. Moderate Impact. CF = 2	10	Forecast 5 – 10% TTF increase. Moderate Impact. CF = 2	10	Flying hour program not available. Assume 25 – 30% increase in TTF based on precedence and ratio **CF = 1**	5	No excess capacity with current and forecast PAA **CF = 0**	0	Flying hour program not available **CF = ?**	?
7. JOINT TRAINING. Preferred to have joint training opportunities and users within 1 to 1.5 hours flight time. (WF = 3)	Numerous users. Close proximity to Airborne unit. CF = 3	9	Numerous users. Close proximity to Airborne unit. CF = 3	9	Adequate users. **CF = 2**	6	Adequate users. **CF = 2**	6	No airdrop mission planned for unit. **CF = 0**	0
8. DROP ZONES (DZ). 2 DZs, 1 minimum, should be available for local training. A circular DZ is highly desired. DZs should be capable of supporting all types of C-17 loads day and night. (WF = 4)	Two DZs for local training. CF = 3	12	Two DZs (one circular) for local training. CF = 3	12	2 DZs for local training. **CF = 3**	12	One DZ for local training. **CF = 3**	12	No airdrop mission planned for unit. **CF = 0**	0
9. MILITARY TRAINING ROUTES. IR and VR routes should be environmentally assessed for flight ops at 300 ft. AGL. Ideally, routes will terminate at a DZ or C-17 ALZ. (WF = 4)	2 IR routes ending at DZ. Moderate terrain available within 2 hr or less. CF = 2	8	7 IR routes (5 end at DZ); 6 SKE routes. Mountainous terrain. CF = 3	12	No IR/VR routes to DZs assessed for C-17 ops. Route design may begin CY01. **CF = 1**	4	No local IR routes to DZ. 2 VR routes to DZ No terrain features. **CF = 2**	8	N/A **CF = 0**	0

Source: WIC Site Matrix, 2001.

Table 9: WIC Site Matrix (2 of 2)

WIC Requirements as of: Feb-12	Charleston	Score	McChord	Score	McGuire	Score	Altus	Score	Jackson	Score
10. ASSAULT ZONE (ALZ) AND AUX FIELD. A C-17 approved ALZ is required. Airspace around an auxiliary field should permit VFR tactical random approaches up to and including 8,000 ft. AGL. (WF = 5)	North Field ALZ. 3 fields with MOAs. CF = 3.	15	Coulee ALZ. 4 fields with MOAs for tactical approach training. 3 of 4 permit high altitude work. CF = 3	15	None currently. SATAF has not selected ALZ location as of Apr 01. Airspace very limited. **CF = 1**	5	ALZ (17C) on the field. Random approaches may adversely affect normal traffic patterns. **CF = 2**	10	No C-17 ALZ programmed. Suitable ALZ located at Ft Polk (Geronimo ALZ) **CF = 2**	10
11. SPECIAL USE AIRSPACE (SUA). SUA capable of supporting dissimilar aircraft operations. Lights-out flight operations for the purposes of NVG training is desirable. (WF = 2)	None identified by KCHS. **CF = 1**	2	R6714, R6703, Okanogan and Juniper Low MOA all within 40 minute flight or less CF = 3	6	Extremely limited SUA. **CF = 1**	2	2 suitable MOAs within 1.5-hour flight time. **CF = 2**	4	2 suitable MOAs within 1.5-hour flight time. **CF = 2**	4
12. AERIAL DELIVERY SUPPORT. Assess the ability of the host wing's ability to support increases in aerial delivery functions such as airdrop, combat offloads (COL), and engine-running on/offloads (ERO). (WF = 3)	Assume minimal impact to manpower requirements. CF = 2	6	Sufficient capability. CF = 3	9	Assume minimal impact to manpower requirements **CF = 2**	6	Currently undermanned by 17 personnel with no projected plus up. **CF = 1**	3	No airdrop mission planned for unit **CF = 0**	0
13. AIR REFUELING (AR). Assess the availability of AR tracks capable of supporting 3-on-3 formations AR as a minimum. (WF =2)	Adequate AR track structure. Numerous tanker units available. CF = 3	6	Excellent AR track structure. Ideal Proximity to KC-135 CES (50 mins) CF = 3	6	Minimal AR track structure. Longer than desired flight time to AR tracks. Numerous tanker units available. **CF = 2**	4	Adequate AR track structure. Numerous tanker units available. **CF = 3**	6	Adequate AR track structure. Numerous tanker units available. **CF = 3**	6
TOTAL CAPABILITY RATING		**75%**		**93%**		**54%**		**51%**		**26%**

NOTES:

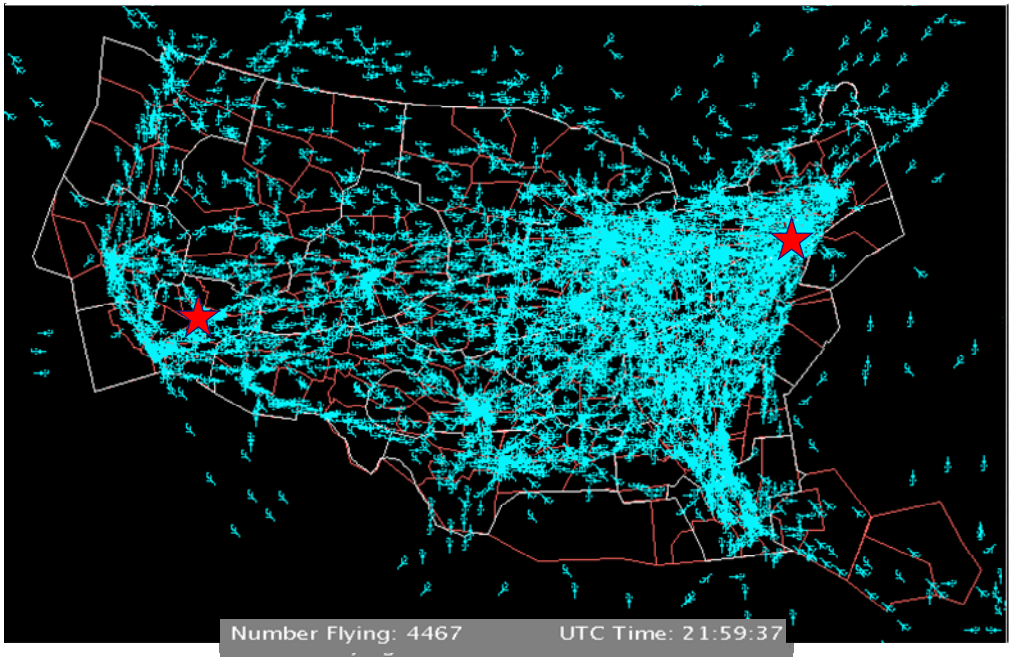
1. Weight Factors (WF). Indicates relative priority among requirements. 5 – Mission Critical; 4 – Significant; 3 – Important; 2 – Desirable; 1 – Marginal Impact
2. Capability Factors (CF). Indicates forecast ability of unit to meet requirement. 3 – Excellent (no improvements); 2 – Satisfactory (minor improvements); 1 – Marginal (major improvements); 0 – Unable
3. Maximum capability score (100 %) = 150 points
4. Abbreviations: **CBT** - Computer Based Training; **CT** – Continuation Training; **IR** - Instrument Route; **JA/ATT** - Joint Airborne Air Transportability Training; **MILCON** – Military Construction; **NVG** – Night Vision Goggles; **PAA** – Primary Aircraft Authorized; **PNAF** – Primary Nuclear Airlift Force; **SOLL II** – Special Operations Low Level II; **SR** – Slow Route; **TWCF** – Transportation Working Capital Fund; **VR** – Visual Route.

Source: WIC Site Matrix, 2001.

Appendix B – Airspace Congestion

Figure 1: Airspace Congestion in the United States

The Northeast Corridor



Humble • Approachable • Credible

6

Source: Nelson, 2008:6

Appendix C – 57 WPS Flying Hour Program

Table 10: 57 WPS C-17 FY11 Flying Hour Program

		57 WPS (WIC - Weapons Instructor Course) C-17 FY11 FLYING HOUR PROGRAM												
PEC: 401891														
PLAN	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
WIC	108	108	108	108	108	108	108	108	109	109	109	109	1300
CUM TOT	108	216	324	432	540	648	756	864	973	1082	1191	1300	

Source: Air Mobility Command, 2010.

Appendix D – C-17 Bases

Table 11: USAF C-17 Globemaster III Bases

AIR MOBILITY COMMAND
Dover Air Force Base, Delaware
Joint Base Lewis-McChord, Washington
Joint Base Charleston, South Carolina
Joint Base McGuire-Dix-Lakehurst, New Jersey
Travis Air Force Base, California
AIR EDUCATION AND TRAINING COMMAND
Altus Air Force Base, Oklahoma
PACIFIC AIR FORCES
Joint Base Elmendorf-Richardson, Alaska
Joint Base Pearl Harbor-Hickam, Hawaii
AIR FORCE MATERIEL COMMAND
Edwards Air Force Base, California
AIR FORCE RESERVE COMMAND
March Air Reserve Base, California
Wright Patterson Air Force Base, Ohio
AIR NATIONAL GUARD
Jackson, Mississippi
Stewart Air National Guard Base, New York

Source: USAF, 2012.

Appendix E – 57 WPS Alternate Basing and TDY Locations

Figure 2: 57 WPS Alternate Basing and TDY Locations

Legend: **Yellow Star: JB McGuire-Dix-Lakehurst (Current 57 WPS location)**
Red Star: Alternate 57 WPS Basing Options (JB Charleston, Altus AFB, & JB Lewis-McChord)
Red "T": 57 WPS Training Locations (JB Elmendorf-Richardson, Nellis AFB, & Mesa, AZ)

Source: Author

Appendix F – Sortie Hours Summary

Table 12: Sortie Hours Summary for Cadre Sorties and ATM Phase

Cadre Currency Sorties

JB McGuire-Dix-Lakehurst Based Flights			JB Lewis-McChord Based Flights (Keep TDYs)			JB Lewis-McChord Based Flights (Adapt TDYs)		
Cadre Sortie	Airdrop Local w/ Tanker		Cadre Sortie	Airdrop Local w/ Tanker		Cadre Sortie	Airdrop Local w/ Tanker	
	En-Route Leg	Time (hrs)		En-Route Leg	Time (hrs)		En-Route Leg	Time (hrs)
	KWRI-KCHS	1.5		KTCM-AR307C	0.6		KTCM-AR307C	0.6
	KCHS-IR035	0.4		AR307C-IR326A	0.4		AR307C-IR326A	0.4
	KXNO-KCHS	0.3		IR326G-KMWH	0.2		IR326G-KMWH	0.2
	KCHS-AR777	1.3		KMWH-KTCM	0.5		KMWH-KTCM	0.5
	AR777-KWRI	0.4		Cruise/Aircraft	1.7		Cruise/Aircraft	1.7
	Cruise/Aircraft	3.9		Aircraft/Sortie	2.0		Aircraft/Sortie	2.0
	Aircraft/Sortie	2.0		Sorties/Yr	20		Sorties/Yr	20
	Sorties/Yr	20		Cruise/Yr	68.0		Cruise/Yr	68.0
	Cruise/Yr	156.0						
	Local Area Flight Only (No Tanker)			Local Area Flight Only (No Tanker)			Local Area Flight Only (No Tanker)	
	Cruise Leg	Time		Cruise Leg	Time		Cruise Leg	Time
	KWRI-SR846	0.3		KTCM-IR326A	0.8		KTCM-IR326A	0.8
	SR846-KNEL	0.1		IR326G-KMWH	0.2		IR326G-KMWH	0.2
	KNEL-KWRI	0.1		KMWH-KTCM	0.5		KMWH-KTCM	0.5
	Cruise/Aircraft	0.5		Cruise/Aircraft	1.5		Cruise/Aircraft	1.5
	Aircraft/Sortie	2		Aircraft/Sortie	2		Aircraft/Sortie	2
	Sorties/Yr	10		Sorties/Yr	10		Sorties/Yr	10
	Cruise/Yr	10.0		Cruise/Yr	30.0		Cruise/Yr	30.0

Advanced Tactical Maneuvering Phase Sorties

JB McGuire-Dix-Lakehurst Based Flights			JB Lewis-McChord Based Flights (Keep TDYs)			JB Lewis-McChord Based Flights (Adapt TDYs)		
Student Phase	Student Sortie Profile		Student Phase	Student Sortie Profile		Student Phase	Student Sortie Profile	
	Cruise Leg	Time		Cruise Leg	Time		Cruise Leg	Time
Advanced Tactical Maneuvering	Local Area Orientation (LAO-1,D/N)		Advanced Tactical Maneuvering	Local Area Orientation (LAO-1,D/N)		Advanced Tactical Maneuvering	Local Area Orientation (LAO-1,D/N)	
	KWRI-SR846	0.3		KTCM-AR307C	0.6		KTCM-AR307C	0.6
	SR846-KWRI	0.1		AR307C-IR326A	0.4		AR307C-IR326A	0.4
	KWRI-AR206H	0.9		IR326G-KMWH	0.2		IR326G-KMWH	0.2
	AR206H-KDOV	1.0		KMWH-KTCM	0.5		KMWH-KTCM	0.5
	KDOV-KWRI	0.3		Cruise/Aircraft	1.7		Cruise/Aircraft	1.7
	Cruise/Aircraft	2.6		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
	Aircraft/Sortie	3.0		Sorties/Yr	2		Sorties/Yr	2
	Sorties/Yr	2		Cruise/Yr	10.2		Cruise/Yr	10.2
	Cruise/Yr	15.6						
	LOWAT (ATM-2, D)			LOWAT (ATM-2, D)			LOWAT (ATM-2, D)	
	KWRI-ATM2LL	0.8		KTCM-ATM2LL	0.7		KTCM-ATM2LL	0.7
	ATM2LL-KWRI	0.9		ATM2LL-KTCM	0.7		ATM2LL-KTCM	0.7
	Cruise/Aircraft	1.7		Cruise/Aircraft	1.4		Cruise/Aircraft	1.4
	Aircraft/Sortie	3.0		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
	Sorties/Yr	2		Sorties/Yr	2.0		Sorties/Yr	2.0
	Cruise/Yr	10.2		Cruise/Yr	8.4		Cruise/Yr	8.4
	TFM (ATM-3, D)			TFM (ATM-3, D)			TFM (ATM-3, D)	
	KWRI-W107	0.3		KTCM-W570	0.5		KTCM-W570	0.5
	W107-KWRI	0.3		W570-KTCM	0.5		W570-KTCM	0.5
	Cruise/Aircraft	0.6		Cruise/Aircraft	1.0		Cruise/Aircraft	1.0
	Aircraft/Sortie	4		Aircraft/Sortie	4.0		Aircraft/Sortie	4.0
	Sorties/Yr	2		Sorties/Yr	2.0		Sorties/Yr	2.0
	Cruise/Yr	4.8		Cruise/Yr	8.0		Cruise/Yr	8.0
	4th Tail Requirement for Phase?			4th Tail Requirement for Phase?			4th Tail Requirement for Phase?	
	Yes/No	Yes		Yes/No	No		Yes/No	No
	Positioning KTCM-KWRI	5.3		~~Positioning KTCM-KWRI~~	~~0~~		~~Positioning KTCM-KWRI~~	~~0~~
	Deposition KWRI-KTCM	5.3		~~Deposition KWRI-KTCM~~	~~0~~		~~Deposition KWRI-KTCM~~	~~0~~
	Requirement/Yr	2		~~Requirement/Yr~~	~~0~~		~~Requirement/Yr~~	~~0~~
	Total Cruise Required	21.2		Total Cruise Required	0		Total Cruise Required	0
	ATM Cruise Total			ATM Cruise Total			ATM Cruise Total	
	ATM Cruise/Yr	51.8		ATM Cruise/Yr	26.6		ATM Cruise/Yr	26.6

Source: Author

Table 13: Sortie Hours Summary for DT Phase

Defensive Tactics Phase Sorties	JB McGuire-Dix-Lakehurst Based Flights			JB Lewis-McChord Based Flights (Keep TDYs)			JB Lewis-McChord Based Flights (Adapt TDYs)		
	Defensive Tactics	Sfc-Air Countertactics I (DT-1,D)		Defensive Tactics	Sfc-Air Countertactics I (DT-1,D)		Defensive Tactics	Sfc-Air Countertactics I (DT-1,D)	
		KWRI-DT1LL	0.8		KTCM-IR326A	0.8		KTCM-IR326A	0.8
		DT1LL-KWRI	0.6		IR326G-KTCM	0.6		IR326G-KTCM	0.6
		Cruise/Aircraft	1.4		Cruise/Aircraft	1.4		Cruise/Aircraft	1.4
		Aircraft/Sortie	3		Aircraft/Sortie	3		Aircraft/Sortie	3
		Sorties/Yr	2		Sorties/Yr	2		Sorties/Yr	2
		Cruise/Yr	8.4		Cruise/Yr	8.4		Cruise/Yr	8.4
		Sfc-Air Countertactics II (DT-2,D)			Sfc-Air Countertactics II (DT-2,D)			Sfc-Air Countertactics II (DT-2,D)	
		KWRI-VR704A	0.7		KTCM-IR326A	0.8		KTCM-IR326A	0.8
		DT2LL-KWRI	0.5		IR326G-KTCM	0.6		IR326G-KTCM	0.6
		Cruise/Aircraft	1.2		Cruise/Aircraft	1.4		Cruise/Aircraft	1.4
		Aircraft/Sortie	3		Aircraft/Sortie	3		Aircraft/Sortie	3
		Sorties/Yr	2		Sorties/Yr	2		Sorties/Yr	2
		Cruise/Yr	7.2		Cruise/Yr	8.4		Cruise/Yr	8.4
		Sfc-Air Countertactics III (DT-3,N)			Sfc-Air Countertactics III (DT-3,N)			Sfc-Air Countertactics III (DT-3,N)	
		KWRI-VR083A	1.3		KTCM-VR1355	0.6		KTCM-VR1355	0.6
		VR083H-R6602	0.3		VR1355-W237A(Low)	0.3		VR1355-W237A(Low)	0.3
		R6602-KWRI	0.9		W237A(Low)-KTCM	0.2		W237A(Low)-KTCM	0.2
		Cruise/Aircraft	2.5		Cruise/Aircraft	1.1		Cruise/Aircraft	1.1
		Aircraft/Sortie	4		Aircraft/Sortie	4.0		Aircraft/Sortie	4.0
		Sorties/Yr	2		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	20		Cruise/Yr	8.8		Cruise/Yr	8.8
		Air-Air Countertactics (DT-4,D)			Air-Air Countertactics (DT-4,D)			Air-Air Countertactics (DT-4,D)	
		KWRI-W107	0.3		KTCM-W570	0.5		KTCM-W570	0.5
		W107-KWRI	0.3		W570-TCM	0.5		W570-TCM	0.5
		Cruise/Aircraft	0.6		Cruise/Aircraft	1.0		Cruise/Aircraft	1.0
		Aircraft/Sortie	4		Aircraft/Sortie	4.0		Aircraft/Sortie	4.0
		Sorties/Yr	2		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	4.8		Cruise/Yr	8.0		Cruise/Yr	8.0
		4th Tail Requirement for Phase?			4th Tail Requirement for Phase?			4th Tail Requirement for Phase?	
		Yes/No	Yes		Yes/No	No		Yes/No	No
		Positioning KTCM-KWRI	5.3		~~Positioning KTCM-KWRI~~	~~0.0~~		~~Positioning KTCM-KWRI~~	~~0.3~~
		Deposition KWRI-KTCM	5.3		~~Deposition KWRI-KTCM~~	~~0.0~~		~~Deposition KWRI-KTCM~~	~~0.0~~
		Requirement/Yr	2		~~Requirement/Yr~~	~~0.0~~		~~Requirement/Yr~~	~~0.0~~
		Total Cruise Required	21.2		Total Cruise Required	0.0		Total Cruise Required	0.0
		DT Cruise Total			DT Cruise Total			DT Cruise Total	
		DT Cruise/Yr	61.6		DT Cruise/Yr	33.6		DT Cruise/Yr	33.6

Source: Author

Table 14: Sortie Hours for AD Phase (1 of 2)

Aerial Delivery Phase Sorties	JB McGuire-Dix-Lakehurst Based Flights			JB Lewis-McChord Based Flights (Keep TDYs)			JB Lewis-McChord Based Flights (Adapt TDYs)		
	Aerial Delivery	Ingress/Egress Methods (AD-1,D)		Aerial Delivery	Ingress/Egress Methods (AD-1,D)		Aerial Delivery	Ingress/Egress Methods (AD-1,D)	
		KWRI-KRME	0.9		KTCM-KYKM	0.3		KTCM-KYKM	0.3
		KRME-KWRI	0.7		KYKM-KTCM	0.4		KYKM-KTCM	0.4
		Cruise/Aircraft	1.6		Cruise/Aircraft	0.7		Cruise/Aircraft	0.7
		Aircraft/Sortie	3		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Sorties/Yr	2		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	9.6		Cruise/Yr	4.2		Cruise/Yr	4.2
		Ingress/Egress Methods (AD-2,N)			Ingress/Egress Methods (AD-2,N)			Ingress/Egress Methods (AD-2,N)	
		KWRI-KXNO	1.5		KTCM-KMWH	0.6		KTCM-KMWH	0.6
		KXNO-KWRI	1.4		KMWH-KTCM	0.5		KMWH-KTCM	0.5
		Cruise/Aircraft	2.9		Cruise/Aircraft	1.1		Cruise/Aircraft	1.1
		Aircraft/Sortie	3		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Sorties/Yr	2		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	17.4		Cruise/Yr	6.6		Cruise/Yr	6.6
		Deploy to PAED			Mass Personnel AD (AD-4,D)			Mass Personnel AD (AD-4,D)	
		KWRI-PAED	7.7		KTCM-KTCM	0		KTCM-KTCM	0
		Cruise/Aircraft	7.7						
		Aircraft/Sortie	3		Cruise/Aircraft	0		Cruise/Aircraft	0
		Sorties/Yr	2		Aircraft/Sortie	3		Aircraft/Sortie	3
		Cruise/Yr	46.2		Sorties/Yr	2		Sorties/Yr	2
					Cruise/Yr	0		Cruise/Yr	0
		CDS/HE Airdrop & Escort (AD-3,D)							
		PAED-Yukon (Appel)	0.8		Deploy to PAED			Deploment Not Required	
		Yukon (Appel)-BGQ	0.8		KTCM-PAED	2.9		KTCM-N/A	0.0
		Malemute DZ-PAED	0.2		Cruise/Aircraft	2.9		Cruise/Aircraft	0.0
		Cruise/Aircraft	1.8		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Aircraft/Sortie	3		Sorties/Yr	2.0		Sorties/Yr	2.0
		Sorties/Yr	2		Cruise/Yr	17.4		Cruise/Yr	0.0
		Cruise/Yr	10.8						
					CDS/HE Airdrop & Escort (AD-3,D)			CDS/HE Airdrop & Escort (AD-3,D)	
		Mass Personnel AD (AD-4,D)			PAED-Yukon (Appel)	0.8		KTCM-IR326A	0.8
		PAED-PAED	0		Yukon (Appel)-BGQ	0.8		IR326G-KTCM	0.6
					Malemute DZ-PAED	0.2			
		Cruise/Aircraft	0		Cruise/Aircraft	1.8		Cruise/Aircraft	0.6
		Aircraft/Sortie	3		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Sorties/Yr	2		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	0		Cruise/Yr	10.8		Cruise/Yr	3.6
		Alternate AD Methods (AD-5,D)			Alternate AD Methods (AD-5,D)			Alternate AD Methods (AD-5,D)	
		PAED-Yukon(Cabin)	0.8		PAED-Yukon(Cabin)	0.8		KTCM-IR348A	0.3
		Buffalo-PAED	1.3		Buffalo-PAED	1.3		IR348K-KTCM	0.8
		Cruise/Aircraft	2.1		Cruise/Aircraft	2.1		Cruise/Aircraft	1.1
		Aircraft/Sortie	4		Aircraft/Sortie	4		Aircraft/Sortie	4
		Sorties/Yr	2		Sorties/Yr	2		Sorties/Yr	2
		Cruise/Yr	16.8		Cruise/Yr	16.8		Cruise/Yr	8.8

Source: Author

Table 15: Sortie Hours for AD Phase (2 of 2)

Aerial Delivery Phase Sorties

Redeploy to KWRI	
KWRI-PAED	6.8
Cruise/Aircraft	6.8
Aircraft/Sortie	3
Sorties/Yr	2
Cruise/Yr	40.8
High Altitude Airdrop (AD-6,D)	
KWRI-KLCK	1.3
KLCK-AR640 Entry	1.5
AR640 Exit-HALO IP	0.9
HALO Exit-KWRI	1.0
Cruise/Aircraft	4.7
Aircraft/Sortie	3
Sorties/Yr	2
Cruise/Yr	28.2
4th Tail Requirement for Phase?	
Yes/No	Yes
Positioning KTCM-PAED	2.9
Deposition PAED-KTCM	2.9
Requirement/Yr	2.0
Total Cruise Required	11.6
AD Cruise Total	
AD Cruise/Yr	181.4

Redeploy to KTCM	
PAED-KTCM	2.9
Cruise/Aircraft	2.9
Aircraft/Sortie	3
Sorties/Yr	2
Cruise/Yr	17.4
High Altitude Airdrop (AD-6,D)	
KTCM-AR626 Entry	0.3
AR626 Exit-TCM HALO	0.3
TCM HALO-KTCM	0.3
Cruise/Aircraft	0.9
Aircraft/Sortie	3
Sorties/Yr	2
Cruise/Yr	5.4
4th Tail Requirement for Phase?	
Yes/No	Yes
Positioning KTCM-PAED	2.9
Deposition PAED-KTCM	2.9
Requirement/Yr	2.0
Total Cruise Required	11.6
AD Cruise Total	
AD Cruise/Yr	90.2

Redeployment Not Required	
PAED-KTCM	0
Cruise/Aircraft	0
Aircraft/Sortie	3
Sorties/Yr	2
Cruise/Yr	0
High Altitude Airdrop (AD-6,D)	
KTCM-AR626 Entry	0.3
AR626 Exit-TCM HALO	0.3
TCM HALO-KTCM	0.3
Cruise/Aircraft	0.9
Aircraft/Sortie	3
Sorties/Yr	2
Cruise/Yr	5.4
4th Tail Requirement for Phase?	
Yes/No	Yes
Positioning N/A	0.0
Deposition N/A	0.0
Requirement/Yr	2.0
Total Cruise Required	0.0
AD Cruise Total	
AD Cruise/Yr	28.6

Source: Author

Table 16: Sortie Hours for DD Phase

Direct Delivery Phase Sorties

JB McGuire-Dix-Lakehurst Based Flights			JB Lewis-McChord Based Flights (Keep TDYs)			JB Lewis-McChord Based Flights (Adapt TDYs)		
Direct Delivery	Direct Delivery Deploy			Direct Delivery Deploy			Direct Delivery Deploy	
	KWRI-KIWA	5.0		N/A			N/A	
	Cruise/Aircraft	5.0						
	Aircraft/Sortie	3.0						
	Sorties/Yr	2.0						
	Cruise/Yr	30.0						
	Mountainous DD (DD-1,D)		Direct Delivery	Mountainous DD, Deploy (DD-1,D)		Direct Delivery	Mountainous DD (DD-1,D)	
	KIWA-DD1LL	0.9		KTCM-DD1LL	2.7		KTCM-DD1LL	2.7
	KGUC-KIWA	1.2		KGUC-KIWA	1.2		KGUC-KTCM	2.1
	Cruise/Aircraft	2.1		Cruise/Aircraft	3.9		Cruise/Aircraft	4.8
	Aircraft/Sortie	3.0		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
	Sorties/Yr	2.0		Sorties/Yr	2.0		Sorties/Yr	2.0
	Cruise/Yr	12.6		Cruise/Yr	23.4		Cruise/Yr	28.8
	SPRO (DD-2,D)			SPRO (DD-2,D)			SPRO (DD-2,D)	
	KIWA-R2305 Entry	0.5		KIWA-R2305 Entry	0.5		KTCM-Hunter/Fresno	1.7
	R2305 Exit-KNXP	0.6		R2305 Exit-KNXP	0.6		Hunter/Fresno-KTCM	1.4
	KNXP-HUNTER MOA	0.6		KNXP-HUNTER MOA	0.6			
	HUNTER MOA-KIWA	1.4		HUNTER MOA-KIWA	1.4			
	Cruise/Aircraft	3.1		Cruise/Aircraft	3.1		Cruise/Aircraft	3.1
	Aircraft/Sortie	3.0		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
	Sorties/Yr	2.0		Sorties/Yr	2.0		Sorties/Yr	2.0
	Cruise/Yr	18.6		Cruise/Yr	18.6		Cruise/Yr	18.6
	Mountainous DD AL/AD (DD-3,N)			Mountainous DD AL/AD (DD-3,N)			Mountainous DD AL/AD (DD-3,N)	
	KIWA-DD3LL	0.3		KIWA-DD3LL	0.3		KTCM-OKANOGAN	0.6
	KFHU-KIWA	0.5		KFHU-KIWA	0.5		OKANOGAN-KMWH	0.2
	Cruise/Aircraft	0.8		Cruise/Aircraft	0.8		KMWH-KTCM	0.5
	Aircraft/Sortie	3		Aircraft/Sortie	3		Cruise/Aircraft	0.8
	Sorties/Yr	2		Sorties/Yr	2		Aircraft/Sortie	3
	Cruise/Yr	4.8		Cruise/Yr	4.8		Sorties/Yr	2
							Cruise/Yr	4.8
	Remote DD/Redeploy (DD-4,D)			Remote DD/Redeploy (DD-4,D)				
	KIWA-DD4LL	0.8		KIWA-IR302I	1.4		Remote DD (DD-4,D)	
	DD4LL-Hog Entry	1.8		IR302O-AR307BW IP	0.8		KTCM-IR302I	1.5
	Hog Exit-AR203NE	0.5		AR307BWEX-KTCM	0.5		IR302O-AR307BW IP	0.8
	AR203NE Exit-KWRI	1.2		Cruise/Aircraft	2.7		AR307BWEX-KTCM	0.5
	Cruise/Aircraft	4.3		Aircraft/Sortie	4		Cruise/Aircraft	2.8
	Aircraft/Sortie	4		Sorties/Yr	2		Aircraft/Sortie	4
	Sorties/Yr	2		Cruise/Yr	21.6		Sorties/Yr	2
	Cruise/Yr	34.4					Cruise/Yr	22.4
	4th Tail Requirement for Phase?			4th Tail Requirement for Phase?				
	Yes/No	Yes		Yes/No	Yes		4th Tail Requirement for Phase?	
	Position KTCM-KIWA	2.3		Position KTCM-KIWA	2.3		Yes/No	Yes
	Deposition KWRI-KTCM	5.3		~~Deposition KIWA-KTCM~~	~~0~~		Position N/A	0
	Requirement/Yr	2		Requirement/Yr	2		Deposition N/A	0
	Total Cruise Required	15.2		Total Cruise Required	4.6		Requirement/Yr	2
							Total Cruise Required	0
	DD Cruise Total			DD Cruise Total			DD Cruise Total	
	DD Cruise/Yr	115.6		DD Cruise/Yr	73.0		DD Cruise/Yr	74.6

Source: Author

Table 17: Sortie Hours for INT Phase

Integration Phase Sorties	JB McGuire-Dix-Lakehurst Based Flights			JB Lewis-McChord Based Flights (Keep TDYs)			JB Lewis-McChord Based Flights (Adapt TDYs)		
	Integration	Deploy to KLSV		Integration	Deploy to KLSV		Integration	Deploy to KLSV	
		KWRI-KLSV	5.5		KTCM-KLSV	1.7		KTCM-KLSV	1.7
		Cruise/Aircraft	5.5		Cruise/Aircraft	1.7		Cruise/Aircraft	1.7
		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Sorties/Yr	2.0		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	33.0		Cruise/Yr	10.2		Cruise/Yr	10.2
		Integration Sortie 1-3 (INT-1,2,3,D)			Integration Sortie 1-3 (INT-1,2,3,D)			Integration Sortie 1-3 (INT-1,2,3,D)	
		KLSV-NTTR	0.2		KLSV-NTTR	0.2		KLSV-NTTR	0.2
		NTTR-KLSV	0.2		NTTR-KLSV	0.2		NTTR-KLSV	0.2
		Cruise/Aircraft	0.4		Cruise/Aircraft	0.4		Cruise/Aircraft	0.4
		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Sorties/Yr	6.0		Sorties/Yr	6.0		Sorties/Yr	6.0
		Cruise/Yr	7.2		Cruise/Yr	7.2		Cruise/Yr	7.2
		MAFEX (INT-4,N)			MAFEX (INT-4,N)			MAFEX (INT-4,N)	
		KLSV-AR3E IP	0.4		KLSV-AR3E IP	0.4		KLSV-AR3E IP	0.4
		AR3E Exit-NTTR	0		AR3E Exit-NTTR	0.9		AR3E Exit-NTTR	0.9
		NTTR-KLSV	0.2		NTTR-KLSV	0.2		NTTR-KLSV	0.2
		Cruise/Aircraft	0.6		Cruise/Aircraft	1.5		Cruise/Aircraft	1.5
		Aircraft/Sortie	4.0		Aircraft/Sortie	4.0		Aircraft/Sortie	4.0
		Sorties/Yr	2.0		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	4.8		Cruise/Yr	12.0		Cruise/Yr	12.0
		Redeploy to KWRI			Redeploy to KTCM			Redeploy to KTCM	
		KLSV-KWRI	5.5		KLSV-KTCM	1.7		KLSV-KTCM	1.7
		Cruise/Aircraft	5.5		Cruise/Aircraft	1.7		Cruise/Aircraft	1.7
		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Sorties/Yr	2.0		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	33.0		Cruise/Yr	10.2		Cruise/Yr	10.2
		4th Tail Requirement for Phase?			4th Tail Requirement for Phase?			4th Tail Requirement for Phase?	
		Yes/No	Yes		Yes/No	Yes		Yes/No	Yes
		Position KTCM-KLSV	1.7		Position KTCM-KLSV	1.7		Position KTCM-KLSV	1.7
		Deposition KLSV-KTCM	1.7		Deposition KLSV-KTCM	1.7		Deposition KLSV-KTCM	1.7
		Requirement/Yr	2		Requirement/Yr	2		Requirement/Yr	2
		Total Cruise Required	6.8		Total Cruise Required	6.8		Total Cruise Required	6.8
		Integration Cruise Total			Integration Cruise Total			Integration Cruise Total	
		INT Cruise/Yr	84.8		INT Cruise/Yr	46.4		INT Cruise/Yr	46.4

Source: Author

Table 18: Sortie Hours for ME Phase

Mission Employment Phase Sorties	JB McGuire-Dix-Lakehurst Based Flights			JB Lewis-McChord Based Flights (Keep TDYs)			JB Lewis-McChord Based Flights (Adapt TDYs)		
	Mission Employment	Deploy to KLSV		Mission Employment	Deploy to KLSV		Mission Employment	Deploy to KLSV	
		KWRI-KLSV	5.5		KTCM-KLSV	1.7		KTCM-KLSV	1.7
		Cruise/Aircraft	5.5		Cruise/Aircraft	1.7		Cruise/Aircraft	1.7
		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Sorties/Yr	2.0		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	33.0		Cruise/Yr	10.2		Cruise/Yr	10.2
		Mission Employment 1 (ME-1,D)			Mission Employment 1 (ME-1,D)			Mission Employment 1 (ME-1,D)	
		KLSV-NTTR	0.2		KLSV-NTTR	0.2		KLSV-NTTR	0.2
		NTTR-KLSV	0.2		NTTR-KLSV	0.2		NTTR-KLSV	0.2
		Cruise/Aircraft	0.4		Cruise/Aircraft	0.4		Cruise/Aircraft	0.4
		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Sorties/Yr	2.0		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	2.4		Cruise/Yr	2.4		Cruise/Yr	2.4
		Mission Employment 2 (ME-2,D)			Mission Employment 2 (ME-2,D)			Mission Employment 2 (ME-2,D)	
		KLSV-NTTR	0.2		KLSV-NTTR	0.2		KLSV-NTTR	0.2
		NTTR-KLSV	0.2		NTTR-KLSV	0.2		NTTR-KLSV	0.2
		Cruise/Aircraft	0.4		Cruise/Aircraft	0.4		Cruise/Aircraft	0.4
		Aircraft/Sortie	4.0		Aircraft/Sortie	4.0		Aircraft/Sortie	4.0
		Sorties/Yr	2.0		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	3.2		Cruise/Yr	3.2		Cruise/Yr	3.2
		Mission Employment 3 (ME-3,N)			Mission Employment 3 (ME-3,N)			Mission Employment 3 (ME-3,N)	
		KLSV-NTTR	0.2		KLSV-NTTR	0.2		KLSV-NTTR	0.2
		NTTR-KLSV	0.2		NTTR-KLSV	0.2		NTTR-KLSV	0.2
		Cruise/Aircraft	0.4		Cruise/Aircraft	0.4		Cruise/Aircraft	0.4
		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Sorties/Yr	2.0		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	2.4		Cruise/Yr	2.4		Cruise/Yr	2.4
		Redeploy to KWRI			Redeploy to KTCM			Redeploy to KTCM	
		KLSV-KWRI	5.5		KLSV-KWRI	1.7		KLSV-KWRI	1.7
		Cruise/Aircraft	5.5		Cruise/Aircraft	1.7		Cruise/Aircraft	1.7
		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0		Aircraft/Sortie	3.0
		Sorties/Yr	2.0		Sorties/Yr	2.0		Sorties/Yr	2.0
		Cruise/Yr	33.0		Cruise/Yr	10.2		Cruise/Yr	10.2
		4th Tail Requirement for Phase?			4th Tail Requirement for Phase?			4th Tail Requirement for Phase?	
		Yes/No	Yes		Yes/No	Yes		Yes/No	Yes
		Position KTCM-KLSV	1.7		Position KTCM-KLSV	1.7		Position KTCM-KLSV	1.7
		Deposition KLSV-KTCM	1.7		Deposition KLSV-KTCM	1.7		Deposition KLSV-KTCM	1.7
		Requirement/Yr	2		Requirement/Yr	2		Requirement/Yr	2
		Total Cruise Required	6.8		Total Cruise Required	6.8		Total Cruise Required	6.8
		Mission Employment Cruise Total			Mission Employment Cruise Total			Mission Employment Cruise Total	
		ME Cruise/Yr	80.8		ME Cruise/Yr	35.2		ME Cruise/Yr	35.2
	TCM Aircraft MX Positioning & Depositioning	Data to source jets from TCM		~~TCM Aircraft MX Positioning & Depositioning~~	~~Data to source jets from TCM~~		~~TCM Aircraft~~	~~Data to source jets from TCM~~	
		Number of jets	3		~~Number of jets~~	~~0~~		~~Number of jets~~	~~0~~
		Rotation Cycle (120 days)	120		~~Rotation Cycle (60 days)~~	~~60~~		~~Rotation Cycle (60 days)~~	~~60~~
		Cycles/Yr	3.04		~~Cycles/Yr~~	~~6.08~~		~~Cycles/Yr~~	~~6.08~~
		Total jet cycles/yr	9.125		~~Total jet cycles/yr~~	~~0~~		~~Total jet cycles/yr~~	~~0~~
		KTCM-KWRI	5.3		~~KTCM-KWRI~~	~~0~~		~~KTCM-KWRI~~	~~0.3~~
		KWRI-KTCM	5.3		~~KWRI-KTCM~~	~~1.5~~		~~KWRI-KTCM~~	~~7.7~~
		Cruise/Cycle	10.6		~~Cruise/Cycle~~	~~1.5~~		~~Cruise/Cycle~~	~~8~~
		Cruise/Yr	96.725		~~Cruise/Yr~~	~~0~~		~~Cruise/Yr~~	~~0~~

Source: Author

Appendix G – Accounting Numbers

Table 19: Accounting Numbers Worksheet

Flying Hour Costs	
Total Flying Hour Cost	$18,150.00
Fuel Per Flight Hour (gal/hr)	2860
FY12 Fuel Cost ($)	$3.95
Variable/Fuel Cost Per Flight Hour	$11,297.00

TDY Costs

Location	Meals						On Base Lodging			Off Base Lodging			Incendentals	
(A Class = Jan-Jun, B Class = Jul-Dec)	A Class		B Class		Total		A Class	B Class	2 Class	A Class	B Class	2 Class	Per Class	2 Class
	Local	Prop.	Local	Prop.	Local	Prop.								
JB Elmendorf-Richardson, AK (PAED)	77	44	77	44	154	88	39	39	78	99	99	198	19	38
Chandler, AZ (KIWA)	66		66		132	0			0	128	105	233	5	10
Pope Field, NC (KPOB)	46	29	46	29	92	58	39	39	78	94	94	188	5	10
Nellis AFB, NV (KLSV)	66	39	66	39	132	78	39	39	78	99	99	198	5	10
JB McGuire-Dix-Lakehurst, NJ (KWRI)	56	34	56	34	112	68	39	39	78	90	90	180	5	10
JB Lewis-McChord, WA (KTCM)	56	34	56	34	112	68	39	39	78	105	105	210	5	10

Personnel Count for TDYs	ATM	DT	AD	DD	INT	ME
Instructors (WOs)	0	0	6	6	7	6
Loadmasters	0	0	5	5	5	5
Intel Support	0	0	2	2	2	2
Students	6	6	6	6	6	6
MX (Per CONOPS)	17	17	17	17	17	17

Vehicle Count for TDY's (by phase)	ATM	DT	AD	DD	INT	ME	Type	Course Totals	Annual Total
Instructors (ACC)	0	0	0	0	1	1	Car	2	4
	0	0	2	2	2	2	Minivan	8	16
	0	0	1	1	1	1	SUV	4	8
Loadmasters (ACC)	0	0	1	1	1	1	Minivan	4	8
	0	0	1	1	1	1	SUV	4	8
	0	0	0	0	0	0	Truck	0	0
Intel Support (ACC)	0	0	1	1	1	1	Car	4	8
ACC Phase Vehicle Totals	0	0	1	1	2	2	Car	6	12
	0	0	3	3	3	3	Minivan	12	24
	0	0	2	2	2	2	SUV	8	16
	0	0	0	0	0	0	Truck	0	0
Students (AMC)	0	0	2	2	2	2	Minivan	8	16
MX (AMC)	2	2	2	2	2	2	SUV	12	24
	2	2	2	2	2	2	Truck	12	24
AMC Phase Vehicle Totals	0	0	2	2	2	2	Minivan	8	16
	2	2	2	2	2	2	SUV	12	24
	2	2	2	2	2	2	Truck	12	24

Nellis Baseline Rentals	Type	Weekly	Total (Incl Tax and Fees)	Tank (gal)	$/gal	$/Week
**Assumes Spring INT Phase, weekly rates quoted from Enterprise on Nellis for 29 Apr-6 May 2012	Car	$194.99	$250.63	17.5	$3.50	$61.25
	Minivan	$290.99	$365.93	20.0	$3.50	$70.00
	SUV(Lg)	$544.99	$670.98	26.0	$3.50	$91.00
	Truck (Lg)	$344.99	$430.78	26.0	$3.50	$91.00

Source: Author

Appendix H – ACC TDY Data for JB McGuire-Dix-Lakehurst

Table 20: ACC AD Phase Costs for JB McGuire-Dix-Lakehurst Option

Aerial Delivery Phase:										
Deployed Day Flights:	3									
Deployed Night Flights:	0									
Deploy/Re-Deploy Days:	2									
Work Day Counter:	8									
Rest Days (1 for 7):	1									
Total TDY Days/Class:	9									
Post Mission Crew Rest	3									
Total Annual TDY Days:	18									
Total Annual PMCR Days	6									
WO PMCR Man-Days/Yr	36									

Cadre Counter	
WO	6
Loadmaster	5
Intel	2
Total	13

Elmendorf Billeting for Cadre	Alpha Daily Rate	Bravo Daily Rate	Annual/room	Annual/All Cadre
	$39.00	$39.00	$702.00	$9,126.00

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	Annual
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	Total Cost
Cadre	1	$250.63	3	$365.93	2	$670.98	0	$430.78	$3,459.06	$6,918.12
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	Annual
Cadre	1	$61.25	3	$70.00	2	$91.00	0	$91.00	$582.75	$1,165.50

Elmendorf Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	Annual Total
Cadre	13	$44.00	$44.00	$19.00	$6,961.50	$6,961.50	$13,923.00

Aerial Delivery Totals	Annual Total Phase Costs
Cadre	$31,132.62

Source: Author

Table 21: ACC DD Phase Costs for JB McGuire-Dix-Lakehurst Option

Direct Delivery Phase:										
Deployed Day Flights:	3									
Deployed Night Flights:	1									
Deploy/Re-Deploy Days:	1									
Extra Planning Day (DD5)	1									
Work Day Counter:	11									
Rest Days (1 for 7):	1									
Total TDY Days/Class:	12									
Post Mission Crew Rest	4									
Total Annual TDY Days:	24									
Total Annual PMCR Days	8									
WO PMCR Man-Days/Yr	48									

Cadre Counter	
WO	6
Loadmaster	5
Intel	2
Total	13

Chandler, AZ Billeting for Cadre	Alpha Daily Rate	Bravo Daily Rate	Annual/room	**Annual/All Cadre**
	$128.00	$105.00	$2,796.00	**$36,348.00**

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Cadre	1	$250.63	3	$365.93	2	$670.98	0	$430.78	$4,612.08	**$9,224.16**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Cadre	1	$61.25	3	$70.00	2	$91.00	0	$91.00	$777.00	**$1,554.00**

Chandler Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
Cadre	13	$66.00	$66.00	$5.00	$10,614.50	$10,614.50	**$21,229.00**

Direct Delivery Totals	**Annual Total Phase Costs**
Cadre	**$68,355.16**

Source: Author

Table 22: ACC INT Phase Costs for JB McGuire-Dix-Lakehurst Option

Integration Phase										
Total TDY Days:	21									
Post Mission Crew Rest	4									
Total Annual TDY Days:	42									
Total Annual PMCR Days	8									
WO PMCR Man-Days/Yr	56									

Cadre Counter	
WO	7
Loadmaster	5
Intel	2
Total	14

Nellis Billeting for Cadre	Alpha Daily Rate	Bravo Daily Rate	Annual/room	**Annual/All Cadre**
	$39.00	$39.00	$1,638.00	**$22,932.00**

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Cadre	2	$250.63	3	$365.93	2	$670.98	0	$430.78	$8,823.03	**$17,646.06**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Cadre	2	$61.25	3	$70.00	2	$91.00	0	$91.00	$1,543.50	**$3,087.00**

Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
Cadre	14	$39.00	$39.00	$5.00	$12,628.00	$12,628.00	**$25,256.00**

Integration Totals	**Annual Total Phase Costs**
Cadre	**$68,921.06**

Source: Author

Table 23: ACC ME Phase Costs for JB McGuire-Dix-Lakehurst Option

Mission Employment (ME) Phase										
Total TDY Days:	14									
Post Mission Crew Rest	4									
Total Annual TDY Days:	28									
Total Annual PMCR Days	8									
WO PMCR Man-Days/Yr	48									

Cadre Counter	
WO	6
Loadmaster	5
Intel	2
Total	13

Nellis Billeting for Cadre	Alpha Daily Rate	Bravo Daily Rate	Annual/room	**Annual/All Cadre**
	$39.00	$39.00	$1,092.00	**$14,196.00**

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Cadre	2	$250.63	3	$365.93	2	$670.98	0	$430.78	$5,882.02	**$11,764.04**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Cadre	2	$61.25	3	$70.00	2	$91.00	0	$91.00	$1,029.00	**$2,058.00**

Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
Cadre	13	$39.00	$39.00	$5.00	$7,722.00	$7,722.00	**$15,444.00**

ME Totals	**Annual Total Phase Costs**
Cadre	**$43,462.04**

Source: Author

Appendix I – ACC TDY Data for JB Lewis-McChord Option (Keep TDYs)

Table 24: ACC AD Phase Costs for JB Lewis-McChord Option (Keep TDYs)

Aerial Delivery Phase:										
Deployed Day Flights:	2									
Deployed Night Flights:	0									
Deploy/Re-Deploy Days:	2									
Work Day Counter:	6									
Rest Days (1 for 7):	0									
Total TDY Days/Class:	6									
Post Mission Crew Rest	2									
Total Annual TDY Days:	12									
Total Annual PMCR Days	4									
WO PMCR Man-Days/Yr	24									

Cadre Counter	
WO	6
Loadmaster	5
Intel	2
Total	13

Elmendorf Billeting for Cadre	Alpha Daily Rate	Bravo Daily Rate	Annual/room	**Annual/All Cadre**
	$39.00	$39.00	$468.00	**$6,084.00**

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Cadre	1	$250.63	3	$365.93	2	$670.98	0	$430.78	$2,306.04	**$4,612.08**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Cadre	1	$61.25	3	$70.00	2	$91.00	0	$91.00	$388.50	**$777.00**

Elmendorf Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
Cadre	13	$44.00	$44.00	$19.00	$4,504.50	$4,504.50	**$9,009.00**

Aerial Delivery Totals	**Annual Total Phase Costs**
Cadre	**$20,482.08**

Source: Author

Table 25: ACC DD Phase Costs for JB Lewis-McChord Option (Keep TDYs)

Direct Delivery Phase:										
Deployed Day Flights:	2									
Deployed Night Flights:	1									
Deploy/Re-Deploy Days:	0									
Extra Planning Day (DD5)	1									
Work Day Counter:	8									
Rest Days (1 for 7):	1									
Total TDY Days/Class:	9									
Post Mission Crew Rest	3									
Total Annual TDY Days:	18									
Total Annual PMCR Days	6									
WO PMCR Man-Days/Yr	36									

Cadre Counter	
WO	6
Loadmaster	5
Intel	2
Total	13

Chandler,AZ Billeting for Cadre	Alpha Daily Rate	Bravo Daily Rate	Annual/room	**Annual/All Cadre**
	$128.00	$105.00	$2,097.00	**$27,261.00**

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Cadre	1	$250.63	3	$365.93	2	$670.98	0	$430.78	$3,459.06	**$6,918.12**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Cadre	1	$61.25	3	$70.00	2	$91.00	0	$91.00	$582.75	**$1,165.50**

Chandler Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
Cadre	13	$66.00	$66.00	$5.00	$7,845.50	$7,845.50	**$15,691.00**

Direct Delivery Totals	**Annual Total Phase Costs**
Cadre	**$51,035.62**

Source: Author

Table 26: ACC INT Phase Costs for JB Lewis-McChord Option (Keep TDYs)

Integration Phase										
Total TDY Days/Class:	21									
Post Mission Crew Rest	4									
Total Annual TDY Days:	42									
Total Annual PMCR Days	8									
WO PMCR Man-Days/Yr	56									

Cadre Counter	
WO	7
Loadmaster	5
Intel	2
Total	14

Nellis Billeting for Cadre	Alpha Daily Rate	Bravo Daily Rate	Annual/room	**Annual/All Cadre**
	$39.00	$39.00	$1,638.00	**$22,932.00**

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Cadre	2	$250.63	3	$365.93	2	$670.98	0	$430.78	$8,823.03	**$17,646.06**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Cadre	2	$61.25	3	$70.00	2	$91.00	0	$91.00	$1,543.50	**$3,087.00**

Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
Cadre	14	$39.00	$39.00	$5.00	$12,628.00	$12,628.00	**$25,256.00**

Integration Totals	**Annual Total Phase Costs**
Cadre	**$68,921.06**

Source: Author

Table 27: ACC ME Phase Costs for JB Lewis-McChord Option (Keep TDYs)

Mission Employment (ME) Phase										
Total TDY Days/Class:	14									
Post Mission Crew Rest	4									
Total Annual TDY Days:	28									
Total Annual PMCR Days	8									
WO PMCR Man-Days/Yr	48									

Cadre Counter	
WO	6
Loadmaster	5
Intel	2
Total	13

Nellis Billeting for Students	Alpha Daily Rate	Bravo Daily Rate	Annual/room	**Annual/All Cadre**
	$39.00	$39.00	$1,092.00	**$14,196.00**

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students	2	$250.63	3	$365.93	2	$670.98	0	$430.78	$5,882.02	**$11,764.04**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students	2	$61.25	3	$70.00	2	$91.00	0	$91.00	$1,029.00	**$2,058.00**

Nellis Per Diem Students	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
	13	$39.00	$39.00	$5.00	$7,722.00	$7,722.00	**$15,444.00**

ME Totals Students	**Annual Total Phase Costs**
	$43,462.04

Source: Author

Appendix J – ACC TDY Data for JB Lewis-McChord Option (Adapt TDYs)

Table 28: ACC AD Phase Costs for JB Lewis-McChord Option (Adapt TDYs)

Aerial Delivery Phase (DEPLOYMENT NOT REQUIRED):										
Deployed Day Flights:	0									
Deployed Night Flights:	0									
Deploy/Re-Deploy Days:	0									
Work Day Counter:	0									
Rest Days (1 for 7):	0									
Total TDY Days/Class:	0									
Post Mission Crew Rest	0									
Total Annual TDY Days:	0									
Total Annual PMCR Days	0									
WO PMCR Man-Days/Yr	0									

Cadre Counter	
WO	0
Loadmaster	0
Intel	0
Total	0

Elmendorf Billeting for Cadre	Alpha Daily Rate	Bravo Daily Rate	Annual/room	**Annual/All Cadre**
	$39.00	$39.00	$0.00	**$0.00**

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Cadre	1	$250.63	3	$365.93	2	$670.98	0	$430.78	$0.00	**$0.00**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Cadre	1	$61.25	3	$70.00	2	$91.00	0	$91.00	$0.00	**$0.00**

Elmendorf Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
Cadre	0	$44.00	$44.00	$19.00	$0.00	$0.00	**$0.00**

Aerial Delivery Totals	**Annual Total Phase Costs**
Cadre	**$0.00**

Source: Author

Table 29: ACC DD Phase Costs for JB Lewis-McChord Option (Adapt TDYs)

Direct Delivery Phase (DEPLOYMENT NOT REQUIRED):										
Deployed Day Flights:	0									
Deployed Night Flights:	0		Cadre Counter							
Deploy/Re-Deploy Days:	0		WO	0						
Extra Planning Day (DD5)	0		Loadmaster	0						
Work Day Counter:	0		Intel	0						
Rest Days (1 for 7):	0		Total	0						
Total TDY Days/Class:	0									
Post Mission Crew Rest	0									
Total Annual TDY Days:	0									
Total Annual PMCR Days	0									
WO PMCR Man-Days/Yr	0									
Chandler,AZ Billeting for	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All Cadre**			
Cadre	$128.00		$105.00		$0.00		**$0.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Cadre	1	$250.63	3	$365.93	2	$670.98	0	$430.78	$0.00	**$0.00**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Cadre	1	$61.25	3	$70.00	2	$91.00	0	$91.00	$0.00	**$0.00**
Chandler Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Cadre	0	$66.00	$66.00	$5.00	$0.00	$0.00	**$0.00**			
Direct Delivery Totals	**Annual Total Phase Costs**									
Cadre	**$0.00**									

Source: Author

Table 30: ACC INT Phase Costs for JB Lewis-McChord Option (Adapt TDYs)

Integration Phase										
Total TDY Days/Class:	21									
Post Mission Crew Rest	4									
Total Annual TDY Days:	42									
Total Annual PMCR Days	8									
WO PMCR Man-Days/Yr	56									

Cadre Counter	
WO	7
Loadmaster	5
Intel	2
Total	14

Nellis Billeting for Cadre	Alpha Daily Rate	Bravo Daily Rate	Annual/room	**Annual/All Cadre**
	$39.00	$39.00	$1,638.00	**$22,932.00**

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Cadre	2	$250.63	3	$365.93	2	$670.98	0	$430.78	$8,823.03	**$17,646.06**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Cadre	2	$61.25	3	$70.00	2	$91.00	0	$91.00	$1,543.50	**$3,087.00**

Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
Cadre	14	$39.00	$39.00	$5.00	$12,628.00	$12,628.00	**$25,256.00**

Integration Totals Cadre	**Annual Total Phase Costs**
	$68,921.06

Source: Author

Table 31: ACC ME Phase Costs for JB Lewis-McChord Option (Adapt TDYs)

Mission Employment Phase										
Total TDY Days/Class:	14									
Post Mission Crew Rest	4									
Total Annual TDY Days:	28									
Total Annual PMCR Days	8									
WO PMCR Man-Days/Yr	48									

Cadre Counter	
WO	6
Loadmaster	5
Intel	2
Total	13

Nellis Billeting for Cadre	Alpha Daily Rate	Bravo Daily Rate	Annual/room	**Annual/All Cadre**
	$39.00	$39.00	$1,092.00	**$14,196.00**

Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students	2	$250.63	3	$365.93	2	$670.98	0	$430.78	$5,882.02	**$11,764.04**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Cadre	2	$61.25	3	$70.00	2	$91.00	0	$91.00	$1,029.00	**$2,058.00**

Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
Cadre	13	$39.00	$39.00	$5.00	$7,722.00	$7,722.00	**$15,444.00**

ME Totals	**Annual Total Phase Costs**
Students	**$43,462.04**

Source: Author

Appendix K – AMC TDY Data for JB McGuire-Dix-Lakehurst Option

Table 32: AMC TDY Costs for JB McGuire-Dix-Lakehurst

JB McGuire-Dix-Lakehurst TDY Data										
Students Per Class	6									
Student TDY Day Count	Arrive	Depart	Total Days							
Alpha Class (Julian Day)	5	166	162							
Bravo Class (Julian Day)	187	350	164							
Annual Total:			326							
McGuire Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room		Annual/All Studs			
	$39.00		$39.00		$12,714.00		$76,284.00			
McGuire Per Diem Students	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	Annual Total			
	6	$56.00	$56.00	$5.00	$38,796.00	$39,528.00	$78,324.00			
MX Support Count	17									
MX TDY Day Count	Arrive	Depart	Total Days							
Alpha Class (Julian Day)	1	166	166							
Bravo Class (Julian Day)	182	350	169							
Annual Total:			335							
McGuire Billeting for TDY Maintenance	Alpha Daily Rate		Bravo Daily Rate		Annual/room		Annual/All MX			
	$39.00		$39.00		$8,697.00		$147,849.00			
Rental Cars	Car		Minivan		SUV		Truck		TDY DAYS	Annual
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	McGuire	Total Cost
Maintenance					2	$670.98	2	$430.78	223	$70,197.85
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	TDY DAYS	Annual
Maintenance					2	$91.00	2	$91.00	223	$11,596.00
McGuire Per Diem Maintenance	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	Annual Total			
	17	$56.00	$56.00	$5.00	$231,251.00	$231,251.00	$462,502.00			

Source: Author

Table 33: AMC AD Phase Costs for JB McGuire-Dix-Lakehurst Option

Aerial Delivery Phase:										
Deployed Day Flights:	3									
Deployed Night Flights:	0									
Deploy/Re-Deploy Days:	2									
Work Day Counter:	8									
Rest Days (1 for 7):	1									
Total TDY Days/Class:	9									
Total Annual TDY Days:	18									
Elmendorf Billeting for Students	Alpha Daily Rate $39.00		Bravo Daily Rate $39.00		Annual/room $702.00		**Annual/All Studs $4,212.00**			
Elmendorf Billeting for TDY Maintenance	Alpha Daily Rate $39.00		Bravo Daily Rate $39.00		Annual/room $702.00		**Annual/All MX $11,934.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students			2	$365.93					$940.96	**$1,881.93**
Maintenance					2	$670.98	2	$430.78	$2,833.10	**$5,666.19**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students			2	$70.00					$180.00	**$360.00**
Maintenance					2	$91.00	2	$91.00	$468.00	**$936.00**
Elmendorf Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Students	6	$77.00	$77.00	$19.00	$5,184.00	$5,184.00	**$10,368.00**			
Maintenance	17	$77.00	$77.00	$19.00	$14,688.00	$14,688.00	**$29,376.00**			
Aerial Delivery Totals	**Annual Total Phase Costs**									
Students	**$16,821.93**									
Maintenance	**$47,912.19**									

Source: Author

Table 34: AMC DD Phase Costs for JB McGuire-Dix-Lakehurst Option

Direct Delivery Phase:											
Deployed Day Flights:	3										
Deployed Night Flights:	1										
Deploy/Re-Deploy Days:	1										
Extra Planning Day (DD5)	1										
Work Day Counter:	11										
Rest Days (1 for 7):	1										
Total TDY Days:	12										
Total Annual TDY Days:	24										
Chandler,AZ Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All Studs**				
	$128.00		$105.00		$2,796.00		**$16,776.00**				
Chandler,AZ Billeting for TDY Maintenance	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All MX**				
	$128.00		$105.00		$2,796.00		**$47,532.00**				
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**	
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**	
Students			2	$365.93					$1,254.62	**$2,509.23**	
Maintenance					2	$670.98	2	$430.78	$3,777.46	**$7,554.93**	
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**	
Students			2	$70.00					$240.00	**$480.00**	
Maintenance					2	$91.00	2	$91.00	$624.00	**$1,248.00**	
Chandler Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**				
Students	6	$66.00	$66.00	$5.00	$5,112.00	$5,112.00	**$10,224.00**				
Maintenance	17	$66.00	$66.00	$5.00	$14,484.00	$14,484.00	**$28,968.00**				
Direct Delivery Totals	**Annual Total Phase Costs**										
Students	**$29,989.23**										
Maintenance	**$85,302.93**										

Source: Author

Table 35: AMC INT Phase Costs for JB McGuire-Dix-Lakehurst Option

Integration Phase										
Total TDY Days:	21									
Total Annual TDY Days:	42									
Nellis Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All Studs**			
	$39.00		$39.00		$1,638.00		**$9,828.00**			
Nellis Billeting for TDY Maintenance	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All MX**			
	$39.00		$39.00		$1,638.00		**$27,846.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students			2	$365.93					$2,195.58	**$4,391.16**
Maintenance					2	$670.98	2	$430.78	$6,610.56	**$13,221.12**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students			2	$70.00					$420.00	**$840.00**
Maintenance					2	$91.00	2	$91.00	$1,092.00	**$2,184.00**
Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Students	6	$66.00	$66.00	$5.00	$8,946.00	$8,946.00	**$17,892.00**			
Maintenance	17	$66.00	$66.00	$5.00	$25,347.00	$25,347.00	**$50,694.00**			
Integration Totals	**Annual Total Phase Costs**									
Students	**$32,951.16**									
Maintenance	**$93,945.12**									

Source: Author

Table 36: AMC ME Phase Costs for JB McGuire-Dix-Lakehurst Option

Mission Employment Phase										
Total TDY Days:	14									
Total Annual TDY Days:	28									
Nellis Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All Studs**			
	$39.00		$39.00		$1,092.00		**$6,552.00**			
Nellis Billeting for TDY Maintenance	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All MX**			
	$39.00		$39.00		$1,092.00		**$18,564.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students			2	$365.93					$1,463.72	**$2,927.44**
Maintenance					2	$670.98	2	$430.78	$4,407.04	**$8,814.08**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students			2	$70.00					$280.00	**$560.00**
Maintenance					2	$91.00	2	$91.00	$728.00	**$1,456.00**
Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Students	6	$66.00	$66.00	$5.00	$5,964.00	$5,964.00	**$11,928.00**			
Maintenance	17	$66.00	$66.00	$5.00	$16,898.00	$16,898.00	**$33,796.00**			
ME Totals	**Annual Total Phase Costs**									
Students	**$21,967.44**									
Maintenance	**$62,630.08**									

Source: Author

Appendix L – AMC TDY Data for JB Lewis-McChord Option (Keep TDYs)

Table 37: AMC TDY Costs for JB Lewis-McChord

JB Lewis-McChord TDY Data							
Students Per Class	6						
Student TDY Day Count	Arrive	Depart	Total Days				
Alpha Class (Julian Day)	5	166	162				
Bravo Class (Julian Day)	187	350	164				
Annual Total:			326				
McChord Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room	**Annual/All Studs**	
	$39.00		$39.00		$12,714.00	**$76,284.00**	
McChord Per Diem Students	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
	6	$56.00	$56.00	$5.00	$40,992.00	$41,724.00	**$82,716.00**
MX Support Count	17						
MX TDY Day Count	Arrive	Depart	Total Days				
Alpha Class (Julian Day)	N/A	N/A	0				
Bravo Class (Julian Day)	N/A	N/A	0				
Annual Total:			0				

Source: Author

Table 38: AMC AD Phase Costs for JB Lewis-McChord Option (Keep TDYs)

Aerial Delivery Phase:										
Deployed Day Flights:	2									
Deployed Night Flights:	0									
Deploy/Re-Deploy Days:	2									
Work Day Counter:	6									
Rest Days (1 for 7):	0									
Total TDY Days/Class:	6									
Total Annual TDY Days:	12									
Elmendorf Billeting for Students	Alpha Daily Rate $39.00		Bravo Daily Rate $39.00		Annual/room $468.00		**Annual/All Studs $2,808.00**			
Elmendorf Billeting for TDY Maintenance	Alpha Daily Rate $39.00		Bravo Daily Rate $39.00		Annual/room $468.00		**Annual/All MX $7,956.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students			2	$365.93					$627.31	**$1,254.62**
Maintenance					2	$670.98	2	$430.78	$1,888.73	**$3,777.46**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students			2	$70.00					$120.00	**$240.00**
Maintenance					2	$91.00	2	$91.00	$312.00	**$624.00**
Elmendorf Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Students	6	$77.00	$77.00	$19.00	$3,456.00	$3,456.00	**$6,912.00**			
Maintenance	17	$77.00	$77.00	$19.00	$9,792.00	$9,792.00	**$19,584.00**			
Aerial Delivery Totals	**Annual Total Phase Costs**									
Students	**$11,214.62**									
Maintenance	**$31,941.46**									

Source: Author

Table 39: AMC DD Phase Costs for JB Lewis-McChord Option (Keep TDYs)

Direct Delivery Phase:										
Deployed Day Flights:	2									
Deployed Night Flights:	1									
Deploy/Re-Deploy Days:	0									
Extra Planning Day (DD5)	1									
Work Day Counter:	8									
Rest Days (1 for 7):	1									
Total TDY Days:	9									
Total Annual TDY Days:	18									
Chandler,AZ Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room		Annual/All Studs			
	$128.00		$105.00		$2,097.00		$12,582.00			
Chandler,AZ Billeting for TDY Maintenance	Alpha Daily Rate		Bravo Daily Rate		Annual/room		Annual/All MX			
	$128.00		$105.00		$2,097.00		$35,649.00			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	Annual
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	Total Cost
Students			2	$365.93					$940.96	$1,881.93
Maintenance					2	$670.98	2	$430.78	$2,833.10	$5,666.19
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	Annual
Students			2	$70.00					$180.00	$360.00
Maintenance					2	$91.00	2	$91.00	$468.00	$936.00
Chandler Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals		A-Total	B-Total	Annual Total		
Students	6	$66.00	$66.00	$5.00		$3,834.00	$3,834.00	$7,668.00		
Maintenance	17	$66.00	$66.00	$5.00		$10,863.00	$10,863.00	$21,726.00		
Direct Delivery Totals	Annual Total Phase Costs									
Students	$22,491.93									
Maintenance	$63,977.19									

Source: Author

Table 40: AMC INT Phase Costs for JB Lewis-McChord Option (Keep TDYs)

Integration Phase										
Total TDY Days:	21									
Total Annual TDY Days:	42									
Nellis Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All Studs**			
	$39.00		$39.00		$1,638.00		**$9,828.00**			
Nellis Billeting for TDY Maintenance	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All MX**			
	$39.00		$39.00		$1,638.00		**$27,846.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students			2	$365.93					$2,195.58	**$4,391.16**
Maintenance					2	$670.98	2	$430.78	$6,610.56	**$13,221.12**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students			2	$70.00					$420.00	**$840.00**
Maintenance					2	$91.00	2	$91.00	$1,092.00	**$2,184.00**
Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Students	6	$66.00	$66.00	$5.00	$8,946.00	$8,946.00	**$17,892.00**			
Maintenance	17	$66.00	$66.00	$5.00	$25,347.00	$25,347.00	**$50,694.00**			
Integration Totals	**Annual Total Phase Costs**									
Students	**$32,951.16**									
Maintenance	**$93,945.12**									

Source: Author

Table 41: AMC ME Phase Costs for JB Lewis-McChord Option (Keep TDYs)

Mission Employment Phase										
Total TDY Days:	14									
Total Annual TDY Days:	28									
Nellis Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All Studs**			
	$39.00		$39.00		$1,092.00		**$6,552.00**			
Nellis Billeting for TDY Maintenance	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All MX**			
	$39.00		$39.00		$1,092.00		**$18,564.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students			2	$365.93					$1,463.72	**$2,927.44**
Maintenance					2	$670.98	2	$430.78	$4,407.04	**$8,814.08**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students			2	$70.00					$280.00	**$560.00**
Maintenance					2	$91.00	2	$91.00	$728.00	**$1,456.00**
Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Students	6	$66.00	$66.00	$5.00	$5,964.00	$5,964.00	**$11,928.00**			
Maintenance	17	$66.00	$66.00	$5.00	$16,898.00	$16,898.00	**$33,796.00**			
ME Totals	**Annual Total Phase Costs**									
Students	**$21,967.44**									
Maintenance	**$62,630.08**									

Source: Author

Appendix M – AMC TDY Data for JB Lewis-McChord Option (Adapt TDYs)

Table 42: AMC TDY Costs for JB Lewis-McChord (Adapt TDYs)

JB Lewis-McChord TDY Data							
Students Per Class	6						
Student TDY Day Count	Arrive	Depart	Total Days				
Alpha Class (Julian Day)	5	166	162				
Bravo Class (Julian Day)	187	350	164				
Annual Total:			326				
McChord Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room	**Annual/All Studs**	
	$39.00		$39.00		$12,714.00	**$76,284.00**	
McChord Per Diem Students	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**
	6	$56.00	$56.00	$5.00	$46,482.00	$47,214.00	**$93,696.00**
MX Support Count	17						
MX TDY Day Count	Arrive	Depart	Total Days				
Alpha Class (Julian Day)	N/A	N/A	0				
Bravo Class (Julian Day)	N/A	N/A	0				
Annual Total:			0				

Source: Author

Table 43: AMC AD Phase Costs for JB Lewis-McChord Option (Adapt TDYs)

Aerial Delivery Phase (DEPLOYMENT NOT REQUIRED):										
Deployed Day Flights:	0									
Deployed Night Flights:	0									
Deploy/Re-Deploy Days:	0									
Work Day Counter:	0									
Rest Days (1 for 7):	0									
Total TDY Days/Class:	0									
Total Annual TDY Days:	0									
Elmendorf Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All Studs**			
	$39.00		$39.00		$0.00		**$0.00**			
Elmendorf Billeting for TDY Maintenance	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All MX**			
	$39.00		$39.00		$0.00		**$0.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students			2	$365.93					$0.00	**$0.00**
Maintenance					2	$670.98	2	$430.78	$0.00	**$0.00**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students			2	$70.00					$0.00	**$0.00**
Maintenance					2	$91.00	2	$91.00	$0.00	**$0.00**
Elmendorf Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Students	6	$77.00	$77.00	$19.00	$0.00	$0.00	**$0.00**			
Maintenance	17	$77.00	$77.00	$19.00	$0.00	$0.00	**$0.00**			
Aerial Delivery Totals	**Annual Total Phase Costs**									
Students	**$0.00**									
Maintenance	**$0.00**									

Source: Author

Table 44: AMC DD Phase Costs for JB Lewis-McChord Option (Adapt TDYs)

Direct Delivery Phase (DEPLOYMENT NOT REQUIRED):										
Deployed Day Flights:	0									
Deployed Night Flights:	0									
Deploy/Re-Deploy Days:	0									
Extra Planning Day (DD5)	0									
Work Day Counter:	0									
Rest Days (1 for 7):	0									
Total TDY Days:	0									
Total Annual TDY Days:	0									
Chandler,AZ Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All Studs**			
	$128.00		$105.00		$0.00		**$0.00**			
Chandler,AZ Billeting for TDY Maintenance	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All MX**			
	$128.00		$105.00		$0.00		**$0.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students			2	$365.93					$0.00	**$0.00**
Maintenance					2	$670.98	2	$430.78	$0.00	**$0.00**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students			2	$70.00					$0.00	**$0.00**
Maintenance					2	$91.00	2	$91.00	$0.00	**$0.00**
Chandler Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Students	6	$66.00	$66.00	$5.00	$0.00	$0.00	**$0.00**			
Maintenance	17	$66.00	$66.00	$5.00	$0.00	$0.00	**$0.00**			
Direct Delivery Totals	**Annual Total Phase Costs**									
Students	**$0.00**									
Maintenance	**$0.00**									

Source: Author

Table 45: AMC INT Phase Costs for JB Lewis-McChord Option (Adapt TDYs)

Integration Phase										
Total TDY Days:	21									
Total Annual TDY Days:	42									
Nellis Billeting for Students	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All Studs**			
	$39.00		$39.00		$1,638.00		**$9,828.00**			
Nellis Billeting for TDY Maintenance	Alpha Daily Rate		Bravo Daily Rate		Annual/room		**Annual/All MX**			
	$39.00		$39.00		$1,638.00		**$27,846.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students			2	$365.93					$2,195.58	**$4,391.16**
Maintenance					2	$670.98	2	$430.78	$6,610.56	**$13,221.12**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students			2	$70.00					$420.00	**$840.00**
Maintenance					2	$91.00	2	$91.00	$1,092.00	**$2,184.00**
Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Students	6	$66.00	$66.00	$5.00	$8,946.00	$8,946.00	**$17,892.00**			
Maintenance	17	$66.00	$66.00	$5.00	$25,347.00	$25,347.00	**$50,694.00**			
Integration Totals	**Annual Total Phase Costs**									
Students	**$32,951.16**									
Maintenance	**$93,945.12**									

Source: Author

Table 46: AMC ME Phase Costs for JB Lewis-McChord Option (Adapt TDYs)

Mission Employment Phase										
Total TDY Days:	14									
Total Annual TDY Days:	28									
Nellis Billeting for Students	Alpha Daily Rate $39.00		Bravo Daily Rate $39.00		Annual/room $1,092.00		**Annual/All Studs $6,552.00**			
Nellis Billeting for TDY Maintenance	Alpha Daily Rate $39.00		Bravo Daily Rate $39.00		Annual/room $1,092.00		**Annual/All MX $18,564.00**			
Rental Cars	Car		Minivan		SUV		Truck		Semi-Annual	**Annual**
	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Total Cost	**Total Cost**
Students			2	$365.93					$1,463.72	**$2,927.44**
Maintenance					2	$670.98	2	$430.78	$4,407.04	**$8,814.08**
Fuel Costs	Count	$/Wk	Count	$/Wk	Count	$/Wk	Count	$/Wk	Semi-Annual	**Annual**
Students			2	$70.00					$280.00	**$560.00**
Maintenance					2	$91.00	2	$91.00	$728.00	**$1,456.00**
Nellis Per Diem	Pax/Class	A-Meals	B-Meals	Incidentals	A-Total	B-Total	**Annual Total**			
Students	6	$66.00	$66.00	$5.00	$5,964.00	$5,964.00	**$11,928.00**			
Maintenance	17	$66.00	$66.00	$5.00	$16,898.00	$16,898.00	**$33,796.00**			
ME Totals	**Annual Total Phase Costs**									
Students	**$21,967.44**									
Maintenance	**$62,630.08**									

Source: Author

Appendix N – ACC TDY Costs Summary

Table 47: ACC TDY Costs Summary Worksheet

JB McGuire-Dix-Lakehurst Based Flights			
CADRE	Billeting Cost	$82,602.00	
	Rental Car Cost	$45,552.38	
	Fuel Costs	$7,864.50	
	Per Diem Cost	$75,852.00	
	Annual TDY Cost	$211,870.88	
	Annual TDY Days	112	
	Annual PMCR Days	30	
	Annual PMCR Man-Days	188	
JB Lewis-McChord Based Flights (Keep TDYs)			**Savings vs. JBMDL**
CADRE	Billeting Cost	$70,473.00	$12,129.00
	Rental Car Cost	$40,940.30	$4,612.08
	Fuel Costs	$7,087.50	$777.00
	Per Diem Cost	$65,400.00	$10,452.00
	Annual TDY Cost	$183,900.80	$27,970.08
	Annual TDY Days	100	12
	Annual PMCR Days	26	4
	Annual PMCR Man-Days	164	24
JB Lewis-McChord Based Flights (Adapt TDYs)			**Savings vs. JBMDL**
CADRE	Billeting Cost	$37,128.00	$45,474.00
	Rental Car Cost	$29,410.10	$16,142.28
	Fuel Costs	$5,145.00	$2,719.50
	Per Diem Cost	$40,700.00	$35,152.00
	Annual TDY Cost	$112,383.10	$99,487.78
	Annual TDY Days	70	42
	Annual PMCR Days	16	14
	Annual PMCR Man-Days	104	84

Source: Author

Appendix O – AMC TDY Costs Summary

Table 48: AMC TDY Costs Summary Worksheet

JB McGuire-Dix-Lakehurst Based Flights				
Billeting	Students	$113,652.00		
	Maintenance	$253,725.00		
Rental Cars	Students	$11,709.76		
	Maintenance	$105,454.17		
Fuel	Students	$2,240.00		
	Maintenance	$17,420.00		
Per Diem	Students	$128,736.00		
	Maintenance	$605,336.00		
Annual Total $	Students	$256,337.76		
	Maintenance	$981,935.17		
TDY Days	Students (from 57th)	112		
	Students (Total)	326		
	Maintenance (from 57th)	112		
	Maintenance (Total)	335		
JB Lewis-McChord Based Flights (Keep TDYs)			**Savings vs. JBMDL**	
Billeting	Students	$108,054.00	$5,598.00	
	Maintenance	$90,015.00	$163,710.00	
Rental Cars	Students	$10,455.14	$1,254.62	
	Maintenance	$31,478.86	$73,975.31	
Fuel	Students	$2,000.00	$240.00	
	Maintenance	$5,200.00	$12,220.00	
Per Diem	Students	$127,116.00	$1,620.00	
	Maintenance	$125,800.00	$479,536.00	
Annual Total $	Students	$247,625.14	$8,712.62	
	Maintenance	$252,493.86	$729,441.31	Man-Days
TDY Days	Students (from 57th)	100	12	72
	Students (Total)	326	0	-
	Maintenance (from 57th)	100	12	204
	Maintenance (Total)	100	235	3,995
JB Lewis-McChord Based Flights (Adapt TDYs)			**Savings vs. JBMDL**	
Billeting	Students	$92,664.00	$20,988.00	
	Maintenance	$46,410.00	$207,315.00	
Rental Cars	Students	$7,318.60	$4,391.16	
	Maintenance	$22,035.20	$83,418.97	
Fuel	Students	$1,400.00	$840.00	
	Maintenance	$3,640.00	$13,780.00	
Per Diem	Students	$123,516.00	$5,220.00	
	Maintenance	$84,490.00	$520,846.00	
Annual Total $	Students	$224,898.60	$31,439.16	
	Maintenance	$156,575.20	$825,359.97	Man-Days
TDY Days	Students (from 57th)	70	42	252
	Students (Total)	326	0	-
	Maintenance (from 57th)	70	42	714
	Maintenance (Total)	70	265	4,505

Source: Author

Appendix P – Sortie Hours Summary

Table 49: Sortie Hours Summary Worksheet

Summary	JB McGuire-Dix-Lakehurst Based Flights		JB Lewis-McChord Based Flights (Keep TDYs)		JB Lewis-McChord Based Flights (Adapt TDYs)	
	57WPS Training Totals (Cadre & Student):		57WPS Training Totals (Cadre & Student):		57WPS Training Totals (Cadre & Student):	
	Total En-Route/Yr (hrs)	838.7	Total En-Route/Yr (hrs)	403.0	Total En-Route/Yr (hrs)	343.0
	Total En-Route FH Cost	$15,222,859	Total En-Route FH Cost	$7,314,450	Total En-Route FH Cost	$6,225,450
	Total En-Route Fuel Cost	$9,475,076	Total En-Route Fuel Cost	$4,552,691	Total En-Route Fuel Cost	$3,874,871
	Cadre Training Totals:		Cadre Training Totals:		Cadre Training Totals:	
	Total En-Route/Yr (hrs)	166.0	Total En-Route/Yr (hrs)	98.0	Total En-Route/Yr (hrs)	98.0
	Total En-Route FH Cost	$3,012,900	Total En-Route FH Cost	$1,778,700	Total En-Route FH Cost	$1,778,700
	Total En-Route Fuel Cost	$1,875,302	Total En-Route Fuel Cost	$1,107,106	Total En-Route Fuel Cost	$1,107,106
	Student Training Totals:		Student Training Totals:		Student Training Totals:	
	Total En-Route/Yr (hrs)	672.7	Total En-Route/Yr (hrs)	305.0	Total En-Route/Yr (hrs)	245.0
	Total En-Route FH Cost	$12,209,959	Total En-Route FH Cost	$5,535,750	Total En-Route FH Cost	$4,446,750
	Total En-Route Fuel Cost	$7,599,774	Total En-Route Fuel Cost	$3,445,585	Total En-Route Fuel Cost	$2,767,765
			Annual Savings compared to JBMDL		Annual Savings compared to JBMDL	
			Total En-Route FH Savings	$7,908,409	Total En-Route FH Savings	$8,997,409
			Total En-Route Fuel Savings	$4,922,385	Total En-Route Fuel Savings	$5,600,205

Move 57 WPS from McGuire Field to McChord Field:
Flight Hour Program Savings: $7.9M (Min) → $9.0M
- Fuel Savings: $4.9M (Min) → $5.6M

Source: Author

Appendix Q – Base Comparison of Total AMC TDY Costs

Table 50: Base Comparison of Total AMC TDY Costs Worksheet

JB McGuire-Dix-Lakehurst Based Flights		JB Lewis-McChord Based Flights (Keep TDYs)		JB Lewis-McChord Based Flights (Adapt TDYs)	
AMC TDY Costs/Savings					
AMC Total TDY Expenditures (Students & MX)		AMC Total TDY Expenditures (Students & MX)		AMC Total TDY Expenditures (Students & MX)	
Total TDY Cost	$1,238,273	Total TDY Cost	$500,119	Total TDY Cost	$381,474
Student Only TDY Cost	$256,338	Student Only TDY Cost	$247,625	Student Only TDY Cost	$224,899
MX Only TDY Cost	$981,935	MX Only TDY Cost	$252,494	MX Only TDY Cost	$156,575
		Annual Savings compared to JBMDL		**Annual Savings compared to JBMDL**	
		Total AMC TDY Cost Savings	$738,154	Total AMC TDY Cost Savings	$856,799
		Total AMC Student Only Cost Savings	$8,713	Total AMC Student Only Cost Savings	$31,439
		Total AMC MX Only Cost Savings	$729,441	Total AMC MX Only Cost Savings	$825,360

Move 57 WPS from McGuire Field to McChord Field :

AMC TDY Cost Savings: $738K (Min) → $857K

Student Only TDY Savings: $9K (Min) → $31K

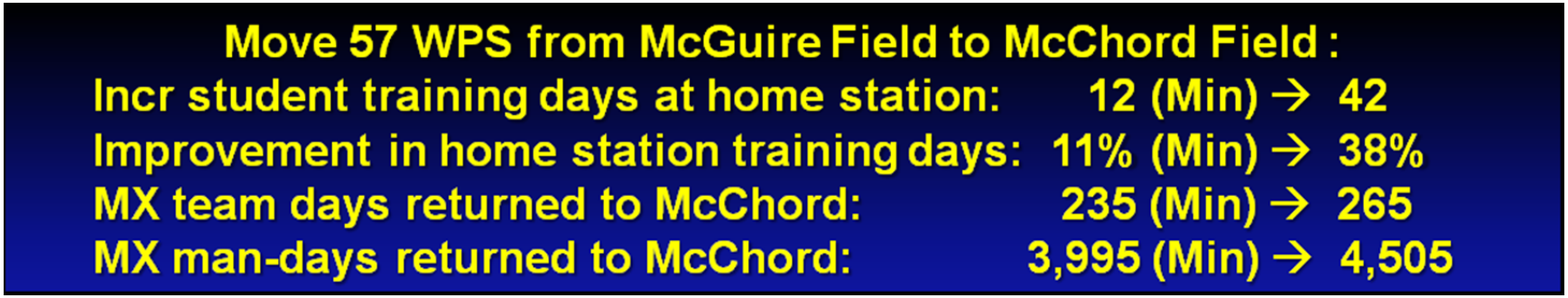
MX Only TDY Savings: $729K (Min) → $825K

Source: Author

Appendix R – Base Comparison of Total AMC Manpower Costs

Table 51: Base Comparison of Total AMC Manpower Costs Worksheet

JB McGuire-Dix-Lakehurst Based Flights		JB Lewis-McChord Based Flights (Keep TDYs)		JB Lewis-McChord Based Flights (Adapt TDYs)	
AMC Manpower Costs/Savings					
AMC Total TDY Expenditures (Students & MX)		AMC Total TDY Expenditures (Students & MX)		AMC Total TDY Expenditures (Students & MX)	
Student TDY Days Away from 57WPS	112	Student TDY Days Away from 57WPS	100	Student TDY Days Away from 57WPS	70
Total Student TDY Days	326	Total Student TDY Days	326	Total Student TDY Days	326
% of Course Students Training at 57WPS	66%	% of Course Students Training at 57WPS	69%	% of Course Students Training at 57WPS	79%
MX TDY Days Away from 57WPS	112	MX TDY Days Away from 57WPS	100	MX TDY Days Away from 57WPS	70
Total MX TDY Days	335	Total MX TDY Days	100	Total MX TDY Days	70
% of Course MX TDY from 57WPS	33%	% of Course MX TDY from 57WPS	100%	% of Course MX TDY from 57WPS	100%
		Annual Savings compared to JBMDL		**Annual Savings compared to JBMDL**	
		Incr student training days at 57WPS	12	Incr student training days at 57WPS	42
		Student local training day improvement	11%	Student local training day improvement	38%
		MX Team days returned to McChord	235	MX Team days returned to McChord	265
		MX Man-Days returned to McChord	3,995	MX Man-Days returned to McChord	4,505

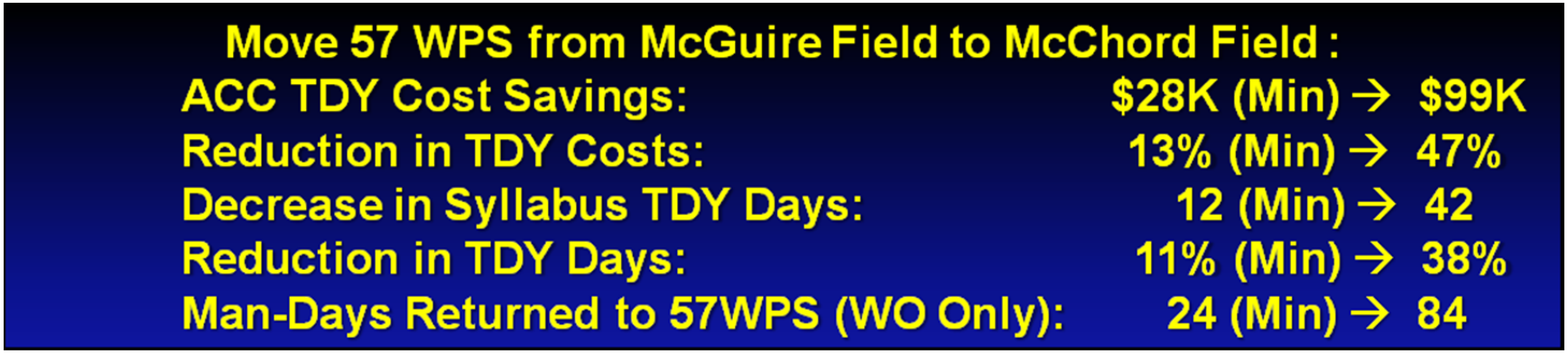


Source: Author

Appendix S – Base Comparison of Total ACC TDY and Manpower Costs

Table 52: Base Comparison of Total ACC TDY and Manpower Costs Worksheet

JB McGuire-Dix-Lakehurst Based Flights		JB Lewis-McChord Based Flights (Keep TDYs)		JB Lewis-McChord Based Flights (Adapt TDYs)	
ACC TDY & Manpower Costs/Savings					
AMC Total TDY Expenditures (Students & MX)		AMC Total TDY Expenditures (Students & MX)		AMC Total TDY Expenditures (Students & MX)	
Annual TDY Cost	$211,871	Annual TDY Cost	$183,901	Annual TDY Cost	$112,383
Annual TDY Days	112	Annual TDY Days	100	Annual TDY Days	70
Annual PMCR Days	30	Annual PMCR Days	26	Annual PMCR Days	16
Annual PMCR Man-Days	188	Annual PMCR Man-Days	164	Annual PMCR Man-Days	104
		Annual Savings compared to JBMDL		Annual Savings compared to JBMDL	
		ACC savings compared to current ops	$27,970	ACC savings compared to current ops	$99,488
		% Reduction in TDY costs	13%	% Reduction in TDY costs	47%
		Decrease in syllabus TDY days	12	Decrease in syllabus TDY days	42
		% Reduction in TDY days	11%	% Reduction in TDY days	38%
		PMCR Man-Days Returned to 57WPS	24	PMCR Man-Days Returned to 57WPS	84

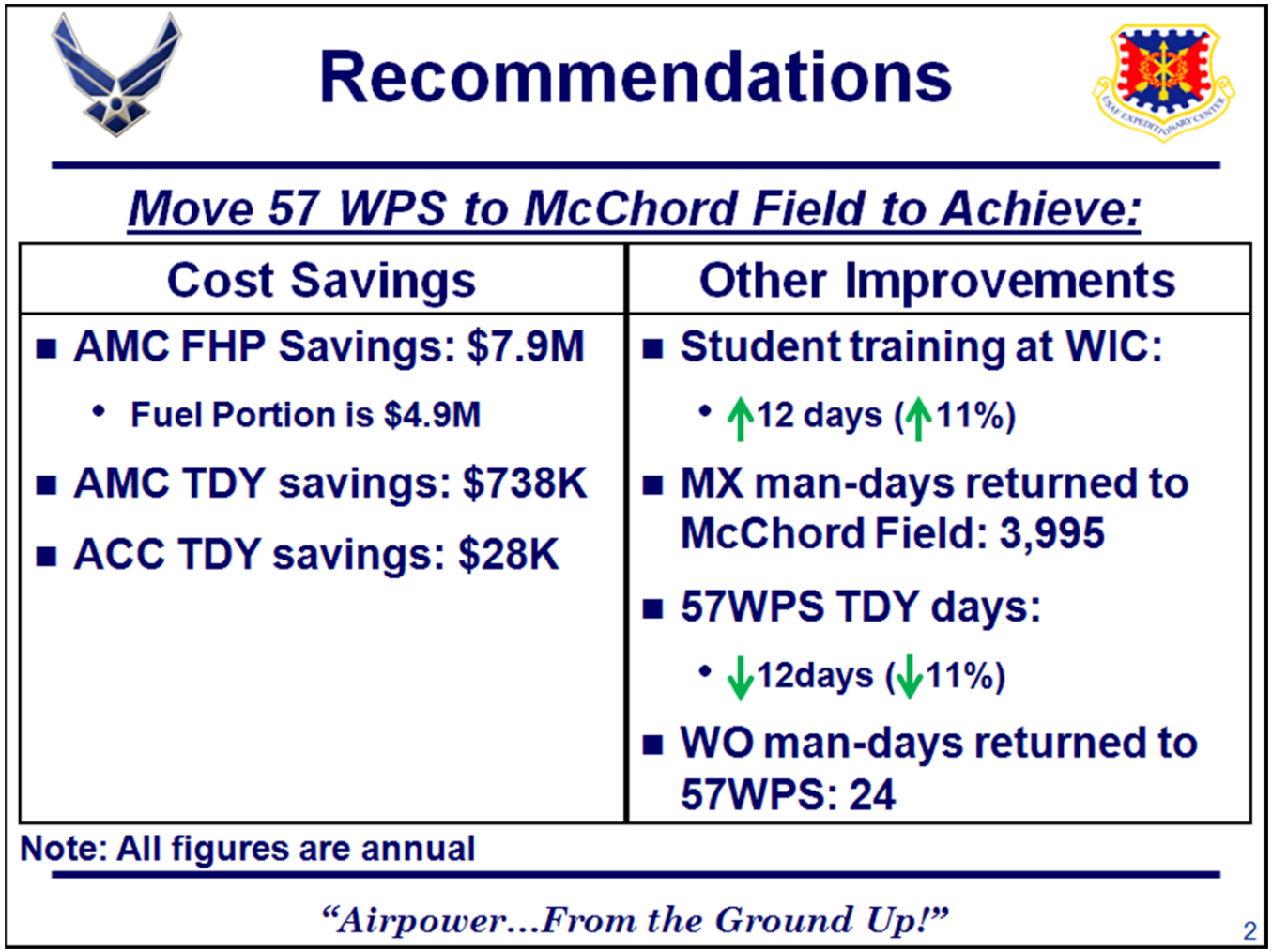


Source: Author

Appendix T – Final Recommendation

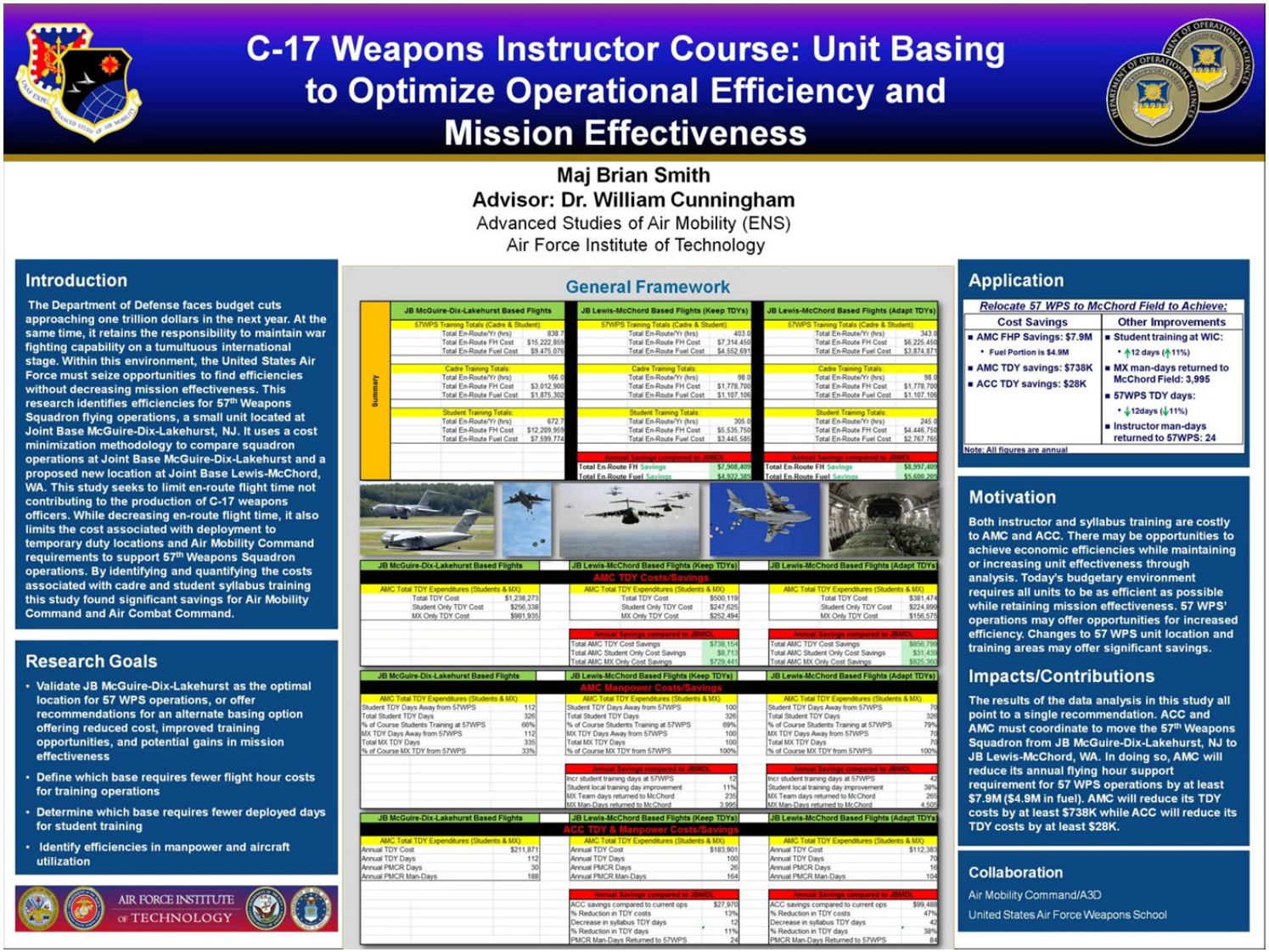
Figure 3: Final Recommendation

(Numbers Represent Minimum Possible Savings)



Source: Author

Figure 4: Quad Chart



Source: Author

Glossary

ACC – Air Combat Command

AD – Aerial Delivery Phase

AFB – Air Force Base

AMC – Air Mobility Command

AMW – Air Mobility Wing

ATM – Advanced Tactical Maneuvering

AW – Airlift Wing

CAF – Combat Air Force

CBA – Cost-Benefit Analysis

CDS – Containerized Delivery System

CFPS – Combat Flight Planning Software

CMA – Cost-Minimization Analysis

COA – Course of Action

CONOPS – Concept of Operations

CONUS – Continental United States

CSAR – Combat Search and Rescue

DACT – Dissimilar Air Combat Training

DD – Direct Delivery Phase

DT – Defensive Tactics Phase

HE – Heavy Equipment

INT – Integration Phase

JA/ATT – Joint Airborne/Air Transportability Training

JB – Joint Base

MAF – Mobility Air Force

MAFEX – Mobility Air Force Exercise

MAJCOM – Major Command (referring to ACC and AMC in this paper)

ME – Mission Employment Phase

NTTR – Nellis Test and Training Range

ROI – Return-on-Investment

SATAF – Site Activation Task Force

SOF – Special Operations Forces

TDY – Temporary Duty

USAFWS – United States Air Force Weapons School

WADS – Western Air Defense Sector

WIC – Weapons Instructor Course

WO – Weapons Officer

WPS – Weapons Squadron

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14. ABSTRACT
The Department of Defense faces budget cuts approaching one trillion dollars in the next year. At the same time, it retains the responsibility to maintain war fighting capability on a tumultuous international stage. Within this environment, the United States Air Force must seize opportunities to find efficiencies without decreasing mission effectiveness. This research identifies efficiencies for 57th Weapons Squadron flying operations, a small unit located at Joint Base McGuire-Dix-Lakehurst, New Jersey. It uses a cost minimization methodology to systematically identify an alternate basing location for the 57th Weapons Squadron and then compare it to the current location in New Jersey. This study seeks to limit en-route flight time not contributing to the production of C-17 weapons officers. While decreasing en-route flight time, this study also limits the cost associated with deployment to temporary duty locations and Air Mobility Command requirements to support 57th Weapons Squadron operations. This paper proposes that by identifying and quantifying the costs associated with cadre and student syllabus training it will find significant savings and maintain or increase 57th Weapons Squadron effectiveness.

15. SUBJECT TERMS
57 Weapons Squadron, USAF Weapons School, Cost Minimization, Flight Hours

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